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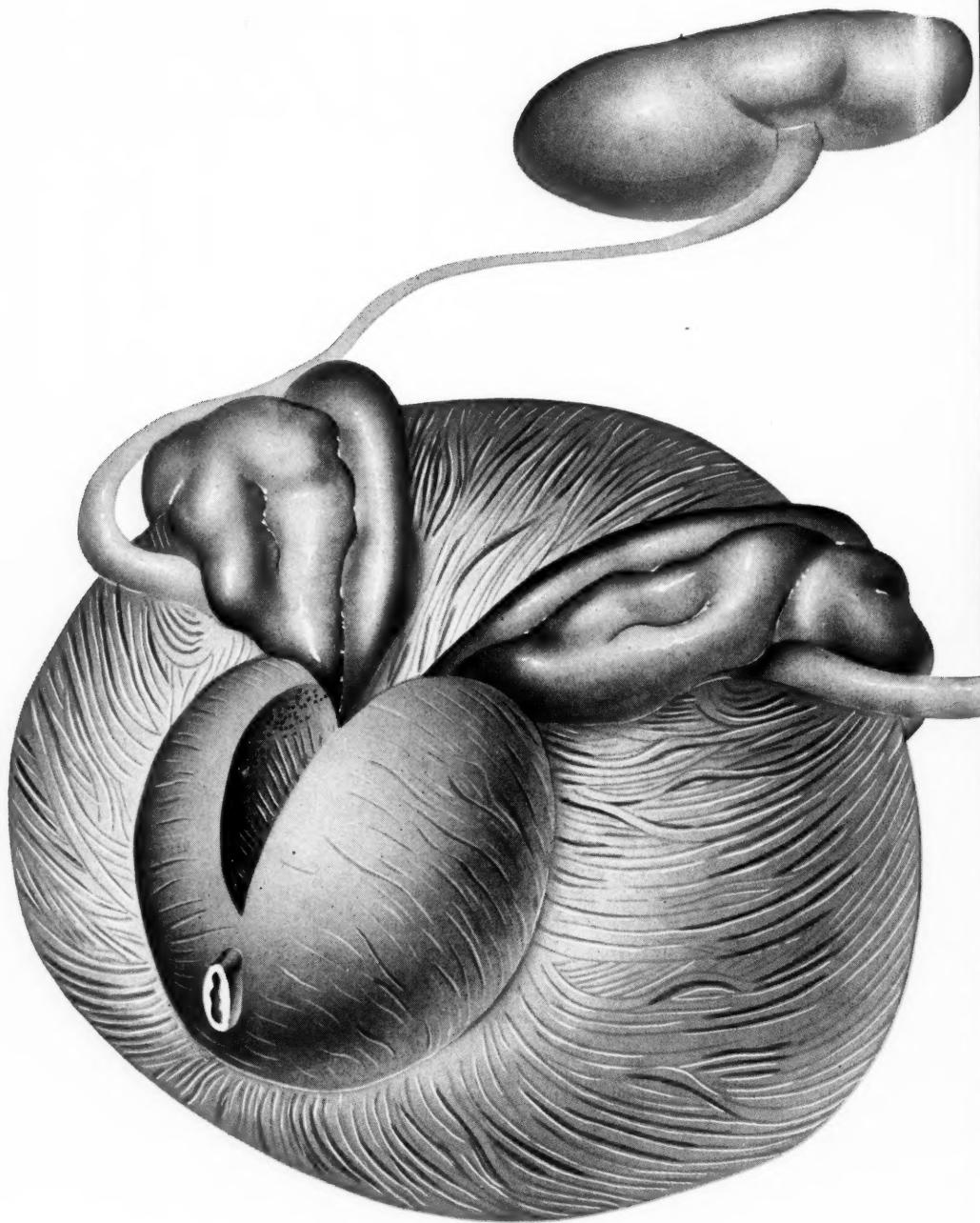
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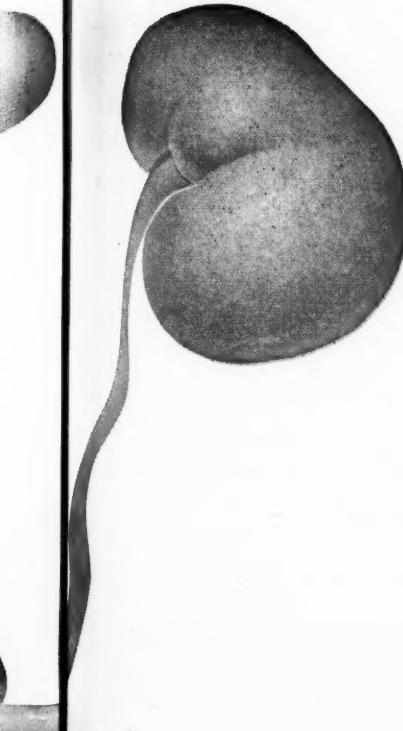


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Original Contributions

Histoplasmosis

Preliminary Report of a Family Outbreak in Minnesota

RICHARD T. SMITH, M.D., and S. J. RAETZ, M.D.
Minneapolis, Minnesota

THE first recognized case of histoplasmosis in the United States was that of a Minnesota farm woman described twenty-eight years ago by Watson and Reilly.¹³ Since then, investigative efforts in many parts of the country have established histoplasmosis as a fungus disease of widespread geographic distribution and a broad range of clinical manifestations.^{1,2,3} The currently recognized endemic area has not included Minnesota with the result that scant attention has been given to the disease as a medical problem in this state. Recent experiences with a family outbreak and the studies thereby stimulated, however, suggest that this disease may be of greater medical importance in the state than previously appreciated. This report describes the clinical features of the outbreak and the preliminary epidemiological investigation. Further epidemiological studies will be presented in detail elsewhere.^{11,12}

Case Reports

Case 1.—(D. H.) On August 27, 1953, a four-year-old Wright County farm boy was admitted to the University of Minnesota Hospitals, Pediatric Service, with a history of fever of one week duration. He had always been in excellent health and had developed normally until approximately two months prior to admission when he became somewhat listless, lost weight, and was noted to have night sweats. Fever was first recorded one week before admission. Examinations during that week at a St. Cloud hospital revealed irregularly spiking fever

From the Laboratories of the Variety Club Heart Hospital, Department of Pediatrics, University of Minnesota, Minneapolis, Minnesota.

Aided by a grant from the Graduate School Medical Research Fund, University of Minnesota.

Dr. Smith is Helen Hay Whitney Research Fellow, University of Minnesota; Dr. Raetz is County Health Officer, Wright County, Minnesota.

with no abnormal physical findings. Peripheral blood studies had revealed the white blood count to be 8,050 per cu. mm. with 64 per cent neutrophils, 29 per cent lymphocytes, 7 per cent eosinophils. Erythrocyte sedimentation rate, Westergren, was 20 mm. in one hour. The initial chest x-ray (Fig. 1a) was considered normal. He was transferred to University Hospitals for further diagnostic studies.

At the time of admission to the University Hospitals the temperature was 103.8° F., the pulse 120; respiratory rate was 30; blood pressure was 90/58. Physical examination revealed pallor, a barely palpable spleen and liver, but was otherwise normal. Laboratory studies gave the following results: white blood count 7,350 per cu. mm. with 69 per cent neutrophils, 24 per cent lymphocytes, 4 per cent monocytes, 3 per cent eosinophils; hemoglobin 12.3 gm. per cent; urinalysis negative; initial cultures of the nose and throat, blood, stools were negative for pathogens; tuberculin test—negative; chest x-ray negative.

Bone marrow biopsy revealed microorganisms morphologically identical to *Histoplasma capsulatum* in its yeast form in many macrophages (Fig. 2). Cultures of this material grew out of the yeast form of this fungus on blood agar plates incubated at 37° after nine days, and the mycelial form of the fungus on Sabouraud's media after seventeen days incubation at room temperature. Typical tuberculate chlamydospores were subsequently demonstrated. Complement fixation with whole yeast phase antigen revealed a 1-80 titer of circulating antibody.* Skin tests on four occasions with two lots of histoplasmin failed to give a positive result. The fungus was subsequently cultured from a venous blood specimen and the yeast forms were seen within polymorphonuclear leukocytes on serial examination of peripheral blood smears.

The clinical course in relation to certain laboratory findings, and treatment is shown in Figure 3. After establishment of the diagnosis on morphologic grounds,

*The authors are indebted to Dr. Amos Christie, Vanderbilt University, Nashville, Tennessee, for performance of this test.

HISTOPLASMOSIS—SMITH AND RAETZ

treatment with ethyl vanillate was started.** Figure 3 shows the dosage of ethyl vanillate employed and the blood levels achieved. Treatment was begun with a dose of 0.5 gm. per kilo; this was gradually increased to

reticulocytes and normoblasts in the peripheral blood. Whether this was an effect of the drug, or hemolytic anemia resulting from the disease could not be determined. Treatment was ineffective in controlling the

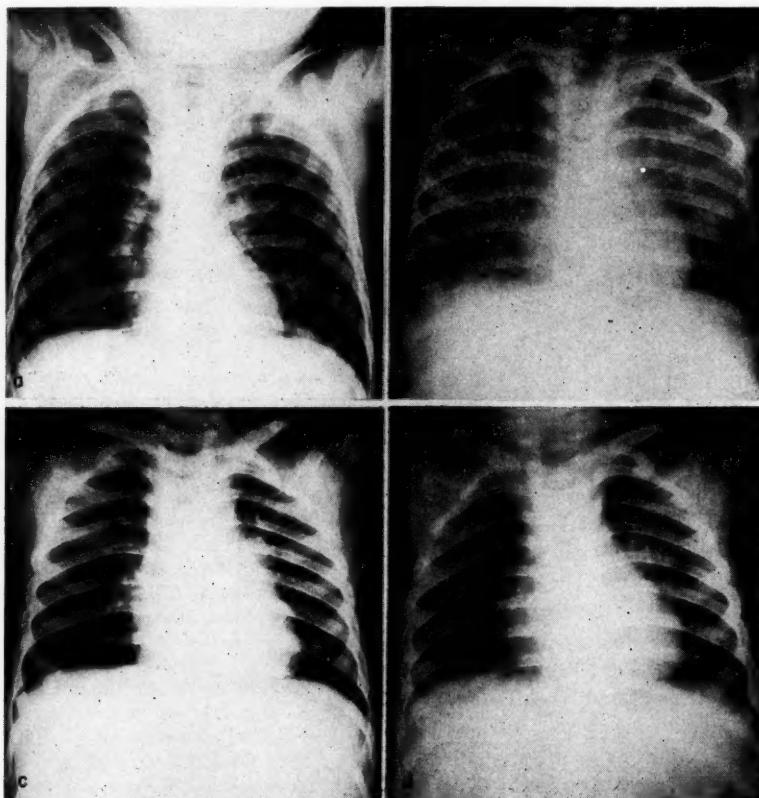


Fig. 1. Chest x-rays illustrating serial changes which occurred in members of H. family involved in the Maple Lake, Minnesota, outbreaks of histoplasmosis 1949-1953.

- (a) Case 1, D. H., August 23, 1953, at onset of fever-negative.
- (b) Case 1, D. H., September 10, 1953, after beginning of respiratory distress—shows diffuse bilateral interstitial pneumonitis.
- (c) Case 2, A. H., June 16, 1954, two weeks after onset of illness—shows peribronchial infiltration bilaterally with a pneumonic process in the left upper lobe subtended by what appears to be an enlarged hilar lymph node.
- (d) Case 2, A. H., July 17, 1954, six weeks after onset of illness. Clearing of the left upper lobe process, and the peribronchial infiltration is shown.

0.9 grams per kilo, divided into twelve daily doses. This maintained the blood levels in the recommended range of 20 to 30 mg. per 100 cc. without significant difficulty until the time of death.†

In spite of treatment there occurred rapid enlargement of the liver and spleen, continued high, spiking fever, and progressive leukopenia and thrombopenia. The hemoglobin value fell from 12.3 gm. per 100 cc. on admission to 6.6 gm. with the appearance of many

rapidly increasing numbers of yeast forms in the bone marrow, or the extent of growth of cultures of the material. Marked respiratory distress accompanied by chest infiltrations demonstrable by x-ray (Fig. 1b) marked the last few days of life. He expired on September 10, twenty-five days after onset of fever. No post-mortem examination was allowed.

Morphologic, serologic, and cultural studies established the diagnosis of disseminated histoplasmosis beyond doubt, in spite of a negative skin test on several occasions. Failure to react to the skin test antigen in the presence of overwhelming infection has been noted by others.

**Ethyl vanillate was generously supplied by E. R. Squibb & Sons, New York.

†Determinations of blood levels of ethyl vanillate were performed in co-operation with R. J. Salmon.

HISTOPLASMOSIS—SMITH AND RAETZ

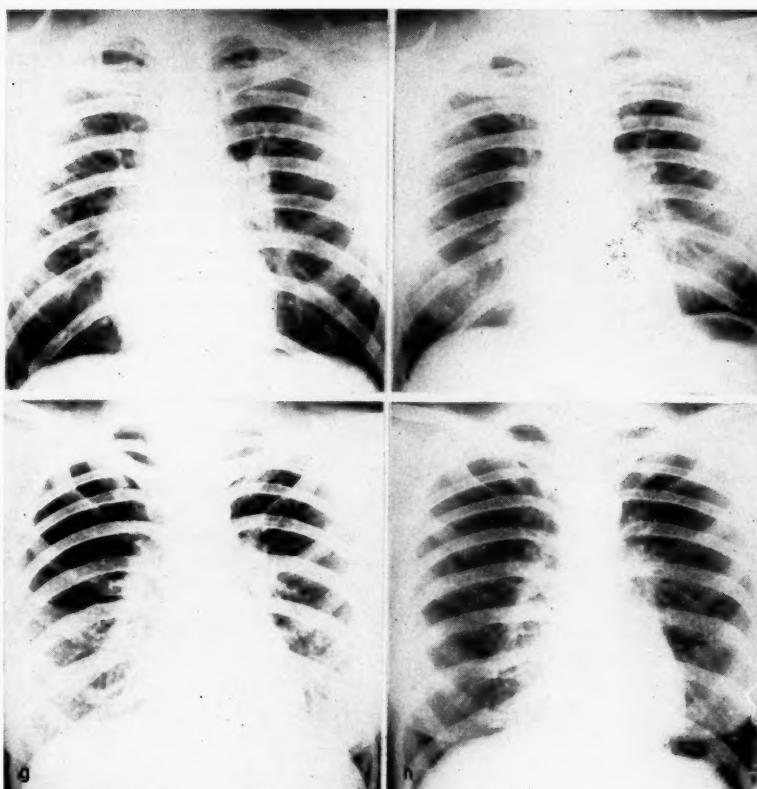


Fig. 1. (e) Case 3, C. H., February 25, 1949, two days after onset of symptoms. Nodular densities and infiltrations in both lung fields with marked increase in hilar shadows.

(f) Case 3, C. H., June 21, 1954, five years after illness, asymptomatic. Fine nodular parenchymal and hilar calcifications are shown.

(g) Case 4, L. H., March 8, 1949, two weeks after onset of symptoms. Shows soft nodular and linear densities in both lung fields with increased size of hilar shadows.

(h) Case 4, L. H., April 27, 1953, four years after illness, asymptomatic. Shows extensive bilateral nodular parenchymal calcifications.

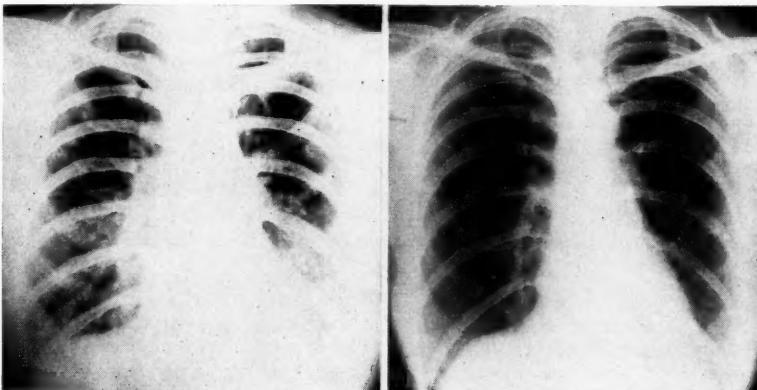


Fig. 1. (i) Case 5, M. H., February 25, 1954, shows bilateral linear and soft nodular densities with marked increased size of hilar shadows.

(j) Case 5, M. H., May 29, 1954, five years after illness, asymptomatic. Bilateral nodular parenchymal calcifications.

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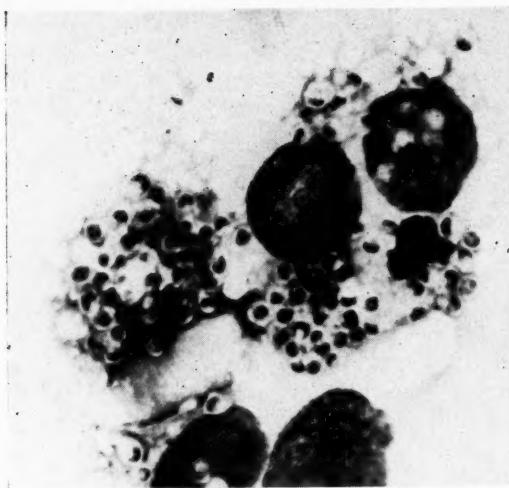


Fig. 2. Sternal bone marrow smear from D. H. (Case 1) taken eight days after onset of illness, showing typical yeast phase *H. capsulatum* within macrophages. Wright-Giemsa stain, X 1200.

cu. mm. with 39 per cent neutrophils, 48 per cent lymphocytes, and 3 per cent eosinophils. Roentgenographic examination of the chest (Fig. 1c) revealed infiltrations in the left upper chest with some enlargement of hilar lymph nodes bilaterally. During hospitalization he continued to run low grade fever with no response to the administration of antibiotics. The infiltrations seen in the chest roentgenograms increased during the first two weeks of illness, then gradually disappeared over a three-month period (Fig. 1d). An erythema multiform type rash appeared approximately thirty days after onset and lasted two days. By the time D. H. was admitted to the University Hospitals this patient was clinically well, having no further cough, fever, or other symptoms. At that time a histoplasmin skin test was performed with a strongly positive result. Complement-fixing antibodies were present in the serum in a 1-32 titer. Bone marrow and sputum smears and cultures were negative for *Histoplasma capsulatum*.

Case 3.—(C. H.) The twenty-eight-year-old father of D. H. was ill four and one half years earlier. On February 22, 1949, he developed fever, chills, headache, cough and profound prostration. Because of these symp-

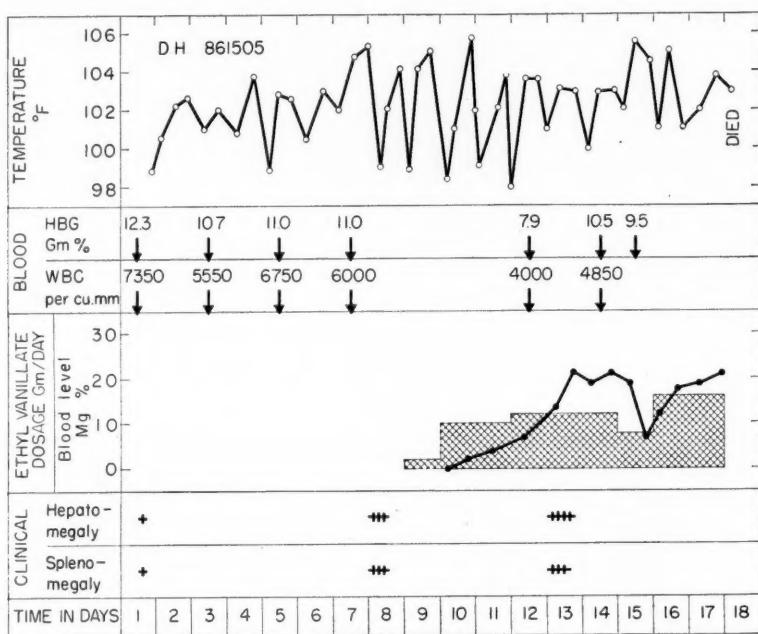


Fig. 3. Chart summarizing various clinical and laboratory features of the illness of D. H. (Case 1).

Case 2.—(A. H.) The two-year-old male sibling of D. H. was well until June 4, 1953, when he developed fever, lethargy, cough, and rapid respirations. He was hospitalized one week later, on June 11, 1953, because of persistence of these symptoms, and failure to respond to antibiotic therapy. At that time physical examination was negative, the white blood count was 11,000 per

toms he was hospitalized. The white blood count was 12,150 with 53 per cent neutrophils, 43 per cent lymphocytes, 1 per cent monocytes, 3 per cent eosinophils. Chest x-ray (Fig. 1e) revealed soft nodular densities in both lung fields with increased size of the hilar shadows. His temperature during six weeks of hospitalization never exceeded 100.6 degrees F.; however, he had fre-

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TABLE I. MAPLE LAKE OUTBREAK, 1949-1953. SUMMARY OF CLINICAL DATA

| Initials | Age | Sex | Date of Onset | Symptoms | Duration | Calcification on Chest X-ray | Histo-plasmin Skin Test | Complement Fixing Test Titer |
|----------|-----|-----|---------------|---|----------|------------------------------|-------------------------|------------------------------|
| DH | 4 | M | Aug. 22, 1953 | Fever, sweats, weight loss, hepatosplenomegaly, positive bone marrow. Died. | 4 weeks | — | — | 1-80 |
| AH | 2½ | M | June 4, 1953 | Cough, fever, malaise, erythema multiforme, negative bone marrow | 8 weeks | + | + | 1-32 |
| LH | 27 | F | Feb. 22, 1949 | Cough, fever, chills, malaise, severely ill. | 8 weeks | + | + | 1-8 |
| CH | 28 | M | Feb. 23, 1949 | Cough, fever, chills, chest pain, prostration, severely ill. | 6 weeks | + | + | neg |
| MH | 55 | F | Feb. 18, 1949 | Fever, chills, nausea, severely ill. | 4-5 wks. | + | + | neg |
| TH | 58 | M | Feb. 18, 1949 | Cough, fever, malaise, mild illness. | 4-6 wks. | ++ | ++ | 1-8 |
| RH | 24 | M | Feb., 1949 | Cough, fever, malaise, mild illness | 1-2 wks. | + | + | neg |
| BH | 55 | M | Feb. 23, 1949 | Fever, malaise, cough | 2 weeks | + | + | neg |

quent chills, and sustained a 35-pound weight loss. Approximately two months were required for recovery of vigor after this disease. In 1953 at the time of D. H.'s illness he was found to have a strongly positive histoplasmin skin test, hilar and parenchymal calcifications in the chest (Fig. 1f) but a negative complement-fixing antibody test.

Case 4.—(L. H.) This twenty-seven-year-old woman, mother of D. H., developed fever, chills, cough, dyspnea, and chest pain on February 22, 1949. The severity of her illness was such as to require two weeks of hospitalization. X-ray examination of the chest at that time revealed numerous linear densities in both lung fields with small, soft, nodular densities in the lung parenchyma bilaterally (Fig. 1g). There were no changes in hilar shadows and the appearance by x-ray suggested the diagnosis of bilateral atypical pneumonia at the time. White blood count was 5,300 with 67 per cent neutrophils, 30 per cent lymphocytes, 2 per cent monocytes and 1 per cent eosinophils. Improvement was very gradual over an eight-week period. However, complete recovery was very slow over the following eight-month period. It is of unusual interest that she was pregnant with D. H. at the time of her illness; although the possibility may be raised that this circumstance played a role in the subsequent illness of D. H., it is purely speculative at the present time. In September, 1951, a routine prenatal x-ray examination of the chest showed multiple nodular calcifications. Because of the appearance of these multiple calcifications, a histoplasmin skin test was performed. This was strongly positive. In October, 1953, complement-fixing antibodies for *Histoplasma capsulatum* were present in a titer of 1-8. A recent chest x-ray showed bilateral nodular calcifications (Fig. 1h). At the present time she is in good health except for occasional chest pain.

Case 5.—(M. H.) The paternal grandmother of D. H., aged fifty-five, became ill on February 18, 1949, with fever, chills, nausea, and severe cough lasting approximately three weeks. At this time she was hospitalized where infiltrations of the chest were demonstrated by chest x-ray (Fig. 1g). She too failed to respond to antibiotic therapy. There was a gradual reduction in fever from a high of 102° F. over a period of two weeks when it became normal. White blood cell count was 10,700 per cu. mm. with 55 per cent neutrophils, 43 per cent lymphocytes and 2 per cent monocytes.

The total duration of illness was approximately five weeks. X-ray of the chest in 1954 revealed multiple calcified nodules throughout the chest (Fig. 1h). A histoplasmin skin test was strongly positive and complement-fixing antibodies were absent from the serum in October, 1953.

Case 6.—(T. H.) The paternal grandfather of D. H., aged fifty-eight, became ill in February, 1949, on approximately the same day as M. H., with fever, cough, and malaise. The symptoms were never severe, but lasted four to six weeks. No x-ray of the chest was taken at that time, and hospitalization was deemed unnecessary. The x-ray of the chest at the present time reveals no calcification. Skin test for histoplasmin is strongly positive. In a serum specimen taken in October, 1953, complement-fixing antibody was present in a dilution of 1-8.

Case 7.—(R. H.) An uncle of D. H., aged twenty-four, was ill during February, 1949, within a few days of the other members of the family, although the exact date was not recalled. His illness was mild, consisting of fever, malaise, and severe cough lasting approximately two weeks. No chest x-rays or other studies were performed at that time. At the present time he is well, has a strongly positive skin test and, except for some hilar calcifications, a negative x-ray. Complement-fixing antibody was absent in an October, 1953, specimen of serum.

Case 8.—(B. H.) A paternal great uncle of D. H., aged fifty-five, became ill on February 23, 1949, with a non-specific febrile respiratory illness consisting of cough and malaise. No hospitalization was required; the duration of illness was approximately two weeks. At the present time he is clinically well, has a strongly positive skin test; roentgenograms of the chest show hilar calcification.

The symptoms, clinical course, and laboratory findings in each of the patients described above are summarized in Table I. Roentgenograms of the chest taken at various times during the course of illness in each of the patients are illustrated in Figure 1. From Table I it may be seen that histoplasmosis in the H. family occurred as two

HISTOPLASMOSIS—SMITH AND RAETZ

distinct groups of cases, the first occurring in February, 1949, and the second during the summer of 1953.

Evidence that the illness of the family in 1949 was symptomatic pulmonary histoplasmosis, is principally inferential. The microorganism was not isolated from any of the patients, and no changes in antibody titers were detected which might provide more direct evidence that the 1949 illness was due to *Histoplasma capsulatum*. Nevertheless, the presumptive evidence that the 1949 outbreak was indeed pulmonary histoplasmosis is quite impressive. Almost simultaneous onset of illness in each member of the family suggests that exposure was simultaneous and that the etiology of their infection was similar. This occurred in the epidemic outbreaks of histoplasmosis which have been studied elsewhere.^{3,5,6} Serial changes in the chest x-ray which are available for C. H., L. H. and M. H., show evolution of a pulmonary lesion from soft, parenchymal infiltrations to the miliary nodular calcifications which characterize their latest chest x-rays, and which is considered to be typical, if not diagnostic, of previous infection with *Histoplasma capsulatum*. In addition two of the persons ill in 1949 still have low complement-fixing antibody titers. At the present time all have positive histoplasmin skin tests. Of three persons for whom serial chest roentgenograms are not available, two have pulmonary calcification at present.

Direct evidence of the etiology of infection in one of the boys is available in the form of culture of the microorganism from bone marrow and blood. Evidence, while presumptive, is good that the other boy had pulmonary histoplasmosis. Although no organism was isolated, a high complement-fixing antibody titer, a positive skin test, and a serial x-ray change resulting in calcification over a year's period provide evidence of the etiology of his pulmonary infection.

All of the persons involved in the outbreak in 1949 have lived on or in the vicinity of the H. family farm. Those who did not live on the farm itself worked frequently in and around the house, barn, or fields. No single specific episode of exposure at which all of the persons who became ill in 1949 could be recalled. The short interval within which symptoms began in all those involved suggests, however, that they were exposed simultaneously to a source of spores.

It was learned that the H. family had moved

on this farm approximately two months prior to the onset of their illness. Each had participated extensively in the cleaning and renovation of the farm buildings and residence house during that period of time. It is recalled by all persons involved that upon many occasions during the cleaning process, clouds of dust were raised in various rooms of the house. No contact with areas in which pigeons or other fowl had been roosting is recalled. As it was winter and there were 2 to 3 feet of snow on the ground, the family infrequently ventured forth from the house as a group. This tends to implicate the house itself as the source of infectious spores. Attempts thus far to isolate *Histoplasma capsulatum* from many samples of dust, soil, and other materials collected around the farm area during October, 1953, have been unsuccessful. Further attempts to isolate the fungus are underway.

The illness of the two children in the family can be less definitely ascribed to a point source of spores. Because of the vague onset of symptoms in the four-year-old boy, no probable time of exposure could be established. For the younger child, the specific date of onset was known. The only known event which might have provided an occasion for massive exposure to infectious spores occurred approximately two weeks prior to onset of illness in the younger boy. At that time a large amount of old hay and straw fell on both of the boys while they were in the main barn area. They were covered with the dust which fell with the straw. Culture of dust from this area six months later failed to reveal infectious spores, however.

From data available in the literature^{8,9} it might be assumed that the incidence of histoplasmin reactors in this part of Minnesota would be very low, perhaps 1 to 5 per cent. In order to make a preliminary determination of the incidence of skin reactivity to the histoplasmin in the immediate area of the farm, a survey was conducted on October 3, 1953.*

For this survey a group of approximately 100 volunteers gathered on the farm. Injections of 0.1 ml. histoplasmin (2-1000 dilution of lot H-KC-5) were made intradermally in the forearm.

*Dr. M. L. Furcolow, Dr. Phillip Danufsky, Dr. Raymond Fagan, and Mr. David Sachs of the U.S.P.H.S. Kansas City Field Station, and Dr. Dean S. Fleming of the Communicable Disease Division, Minnesota Department of Health, collaborated in this phase of the investigation.

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HISTOPLASMOSIS—SMITH AND RAETZ

The reactions were read forty-eight hours after application, an area of induration 5 mm. in transverse diameter or greater being interpreted as a positive test. Blood specimens were taken from the reactors for precipitin and complement-fixing antibody titers. As the population tested consisted of volunteers and not a random sample of the population, the results provided only a preliminary indication of the incidence of histoplasmin sensitivity in this area. More extensive studies of skin reactivity to histoplasmin and tuberculin in Wright County will be reported subsequently.¹¹

Table II gives the results of this preliminary survey of volunteers. The data is arranged in two categories; those persons tested who have had previous contact with the site of the outbreak, and those who had never had contact with the site. The data indicate that 10.8 per cent of those never on the premises before the time of the survey were reactors, whereas 50 per cent of those who had visited or worked there were reactors; 26.3 per cent of the entire seventy-six persons from whom information as to previous contact with the farm had been obtained were positive reactors. None of the positive reactors had significant complement-fixing antibody titers.

In addition, a number of animals on the farm were tested for histoplasmin sensitivity in accordance with the method of Menges.⁷ Of thirty-three cows tested, five were found to be reactors. Of three dogs tested, one was found to be positive, and of three rabbits tested, none was positive. The precipitin test in two of the cows was positive in a 1-5 and 1-10 dilution, respectively.

This series of cases illustrates the broad spectrum of clinical manifestations which may result from infection by *H. capsulatum*. Case 1, D. H., illustrates the disseminated systemic, usually fatal type of the disease in which the yeast form of the fungus multiplies rapidly within the macrophages of the reticuloendothelial system. The fungus spreads throughout the body, producing enlargement of the liver, spleen, lymph nodes, high spiking fever, dissemination through the blood and eventually death. This form of the disease, in contrast to past notions, appears to be the rarest manifestation of infection and occurs principally at the extremes of life or in debilitated patients. The pulmonary form of the disease is well illustrated by Cases 2, 3, 4, 5, and 6. In these patients there was abrupt onset of fever, chills, cough, and

TABLE II. RELATIONSHIP BETWEEN EXPOSURE TO SITE OF MAPLE LAKE OUTBREAK AND SKIN SENSITIVITY TO HISTOPLASMIN

| Exposure History | Histoplasmin Skin Test Result | | |
|---------------------------------------|-------------------------------|-----------------|------------------|
| | Number Tested | Number Positive | Percent Positive |
| Never on premises at site of outbreak | 46 | 5 | 10.8 |
| Visited or worked on premises | 30 | 15 | 50.0 |
| Total | 76 | 20 | 26.3 |

other symptoms of pulmonary involvement of varying severity. In each there was no response to antibiotic therapy, and the illness lasted for a prolonged period of time, clinically resembling atypical pneumonia. Less severe symptomatic forms of pulmonary involvement is illustrated by Cases 7 and 8. Their infections would have passed unnoticed had not the other members of the family been so severely involved. Their infection did, however, result in sensitivity to the fungus antigen and pulmonary calcification. Other types of histoplasmosis which have been reported, including local forms¹⁴ and chronic pulmonary histoplasmosis resembling tuberculosis,⁴ were not seen in the epidemic.

This outbreak emphasizes the fact that histoplasmosis occurs in Minnesota. One previous outbreak has been reported by Ruteledge¹⁰ and later by Furcolow.³ This epidemic occurred in Detroit Lakes in 1948, and was similar in many ways to that reported here. In the adult members of a family, simultaneous onset of a diffuse pulmonary disease with slow recovery occurred. Spores were isolated from beneath the kitchen floor. The occurrence of these two epidemics should alert the Minnesota physician to the possibility that some of the puzzling unexplained types of pneumonitis occasionally encountered in his practice might be due to *H. capsulatum* infection. It also indicates an urgent need for more incisive information than is currently available on the prevalence of the fungus, the disease, and skin test reactors in the state.

Summary

The clinical and epidemiological aspects of an outbreak of histoplasmosis occurring in rural Minnesota have been described. Six adults and two children manifested a broad range of clinical

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"Ideal" Socialized Medicine

JAMES ROGERS FOX, M.D.
Minneapolis, Minnesota

BECAUSE the general trend of socialized medicine is insidious and because so many proponents of such a scheme for the United States frequently cite the Scandinavian countries and Great Britain as examples of apparent success, it has become evident that even in the light of a current dormancy in legislative attempt, the medical profession as a whole must be informed of the salient features of these various programs. For this reason I have summarized the results of my recent observations for your consideration and cogitation. In 1952 I was fortunate to be in the position of practicing medicine in Great Britain under the panel system, a report of which was made in 1953.^{1,2} This experience gave me the opportunity of learning the hidden and often serious problems to look for in terms of care of the patient, standards of practice, encroachment upon freedom, and preparation for the future, as in training and research. With this background and with numerous relationships having been established, I returned in 1954 to Great Britain where a progress report was undertaken. Following this several weeks were spent in Norway, Sweden, and Denmark. The general approach was to interview the following groups: (1) organized medicine in the form of the medical association, (2) government medicine which included the director of the program and his associates, (3) the practicing general physician in both urban and rural areas, (4) the specialist both in the hospital and in the private practice, (5) the medical student and graduate student, (6) the beginning practitioner, (7) the patient, and finally (8) the press. It was my feeling that each had an "axe to grind" and that only in talking with all of them could I get a relatively true picture without actually participating in the practice. In addition, by being alone with the various individuals and by proper rapport (including judicious use of the "juice of the grape") I found

them more ready to discuss freely and to criticize constructively the programs. The survey was conducted with co-operation from the American and the World Medical Associations, together with the Norwegian, Swedish and Danish medical associations and government agencies.

With this as a background as to the experience and mode of approach established for this study, I should like further to point out briefly some other factors which contribute markedly to the reason for such programs having evolved. Historically one must remember that the United States grew from infancy as a democracy. Conversely, the European countries have struggled from the dominance of the feudal system and it is fairly evident that changing an adult is more difficult than training a child. Thus different measures were necessary. As a result, though existing as democracies, the respective countries themselves are different. Tradition plays an extremely important role also—one which is difficult for us to understand in light of the fact that a change from tradition could produce more efficient effect in many instances. The population and size of the countries together with communications, transportation and finances also point out the fact that in *no* way can any program be compared with nor suggested for the United States. Whereas the United States has forty-eight states and 160 million people, Great Britain has a population of about 50 million and is the size of Minnesota; Norway has 3.3 million and compares in square miles with Arizona; Sweden's size is analogous to that of California and there are 7.1 million people; and Denmark is the size of Maryland with a population of 4.3 million. Their problems, then, are those of a single state. There are about 35,000 physicians in Great Britain, 3,500 in Norway, 5,500 in Sweden, and 4,300 in Denmark. In each instance there is no more desirable patient-doctor ratio than in the United States and in some instances, less.

Another significant fact to remember is that in

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each of the countries described the general practitioner is *not* permitted to care for his patients in the hospital but must refer them to the specialist who then takes over the care of the patient and returns him to the general physician upon discharge. This of course disrupts the continuity of care and does not encourage the stimulation of the general physician.

Two arguments noted were that the general men in these countries did not miss the continuity and that the system in the United States resulted in the general physician overstepping his training or ability. In refutation I noted that younger men in the countries were against this old tradition; that Dr. Charles Fleming, the Principal Medical Officer for Scotland, wrote an extensive treatise regarding the need for that change and others corresponding to United States practices;³ and finally, that in both instances it depends upon the integrity of the man and his recognition of his own limitations.

Doctor Collis of Dublin wrote similarly of this need in his citing the United States in encouraging ideal medical education and practices.⁴ Insofar as medical training and postgraduate training are concerned, one can say generally that the students in each country are of high calibre and well trained. The medical care, training, research, and programs in the teaching hospitals were comparable to the United States; however, in general, the equipment and facilities, though adequate, were not. This is undoubtedly temporary as a result of the war and in certain instances they were as good. There are very few private hospitals (usually religious or Red Cross), and in Great Britain a good number of nursing homes are used by the general practitioner and his consulting specialist. Surgery and obstetrics are done there, but very few, if any, laboratory procedures. Thus the hospitals are government owned and administered. Therefore you can see that there are two basic segments to medicine in Europe, the general physician in home care without the use of a hospital and the specialist in hospital care. The effect this has played in the socialization schemes will be noted.

In order to give the full picture in detail, this paper would have to become a book; therefore only the significant points will be covered and you must keep in mind that there are always exceptions which, for lack of space, may be omitted. One decided general impression is that there is a

great deal of good along with the bad and potential dangers in each of the schemes, but that one must see the needs and application to the country involved to understand its evolution. In no instance can any phase of any country be compared with the United States.

Great Britain

In Great Britain socialized (or nationalized, as they prefer to call it) medicine really began in 1911 as the panel system, whereby the government began paying physicians for caring for some patients. For many years this included only those who earned less than 400 pounds a year. (This was equivalent to \$2,000 but possessed a greater buying power.) The program was carefully thought out and further extensions were planned. The Conservative party, not the Labor party as we have believed, was the originator of the program and was in the process of consultation (admittedly slow) with the Britain Medical Association, when the Labor party through its Bevan made the program a political football and, with votes in mind rather than British health, thrust it through. This was greatly enhanced by the poor co-operation of the voting conservative population. The cost was estimated in 1948, when the plan was begun, at 510 million dollars. The mechanism was to be simple and it is, for the basic plan had been in effect for thirty-seven years. However, the cost in 1951 was 1.3 billion dollars and about 1.5 billion dollars for 1952. The Conservative government has set a 1.2 billion dollar limit per year thereafter. However, one can see that some of the problems are being met, but slowly. Thus, as I have been told, "when we get the rough edges off and are used to the scheme, it will not be so bad."

The plan is compulsory for all and is directly under the control of the government with local subdivisions. Physicians are *not* in control. The plan is payed for either directly to the government or by the usual deduction if the person is on a payroll. It is included in the fee for all social benefits which, if calculated by population, will not in itself run the program in the black. The panel system involves the general practitioner. The general physicians are not centralized, but rather tend to care for the patients in their own area. Thus, it was simple to continue this tradition, and in becoming a panel member, the patient merely signs up for a year with the doctor of his

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choice. The number of patients is limited to 3,500 per doctor (having been cut from 4,000) and includes children. The doctor cannot see any more than this according to the system. Thus there is some restriction to patient choice; however, could you as a general physician care for 3,500 people as often as they desire in a year? With better than 90 per cent of Britain now gainfully employed, some patients, who formerly had time to wait their turn, now will pay to be seen. With this increase in private practice the doctor is supposed not to show discrimination, but as one man said "human nature frequently prevails." The adjustments made in the past years include that of an increase in fee and decrease (by 500) in the number patients per physician. Currently the pay is \$2.38 per head per year for the first five hundred; \$3.78 for the next one thousand and \$2.38 for the remaining two thousand (total about \$9,700). If a doctor has a certain number of patients, he can now obtain through the Health Service an assistant who receives a straight salary of about \$2,000.

Some of the original problems appear to be combated on the surface, but in place of them there are others. With the increase in fee and decrease in patient load to the general practitioner, the specialist group was up in arms for an increase. The training of students and paying of salaries of about \$5,000 to what corresponds to our senior resident has increased the number of specialists to the point where there are not enough hospital positions and they will not be accepted in general practice. The increase in employment has worked to the advantage of private paying practice as noted. With the bureaucracy of the Health Service, as I was told by a physician high in government service, several major problems have resulted: (1) Because of the disadvantage in being a general physician, most students intend to specialize (this I noted personally while a member of the University of Edinburgh faculty). (2) The general physician now has little opportunity to specialize, for he finds it impossible to get a position in training. (3) The general physician may *not* change jobs as he desires. He must apply to the Executive Council (not doctors) of a given community to set up practice there. This he cannot do unless the council feels the area is underdoctored. Thus the freedom of practice location is no longer free! (4) In addition, it is noted that there are fewer general physicians

striving for advance degrees—a fact particularly true in the past. A gradual decline of general practice was predicted, with the one redeeming note being that an Academy of General Practice has been founded.

There are some general physicians, particularly in industrial areas, who enjoy the Health Service remuneration, for they did not have it in the past. Most with whom I talked at length felt they had compromised themselves.

The specialist is not paid in the same manner as the general physician, but rather generally has an appointment to one of the hospitals where he is paid according to the number of sessions he works—a total of eleven sessions are possible at \$560 each. In addition he may make up to fifty domiciliary calls at \$12 each (a total of about \$6,800). However he may and does see private patients in consultation. In addition, 35 per cent of the specialists receive "merit awards" each year ranging from \$1,400 to \$7,000. Reputedly there is a fair manner of selection, but there is also the human equation!

From another authority I learned that the established specialists were faring remarkably, but that the newer men were receiving positions on a straight salary only and that the intent of the government circles is to place them all under civil service, which then would negate what few bargaining rights are left. Medical facilities, equipment and the like are improving, but this is due more to the relaxing of government control on rationing material and construction with resultant new building.

The specialists' problems, besides those noted above, include the fact that there are too many for the number of positions. As a result, in Great Britain as well as in the Scandinavian countries, the most junior staff man is usually in his forties. Two other examples of bureaucracy are these: in attempting to get a man for a position in a hospital, the chief may not hire whom he desires, but must show first the need, and then take it through the chain of command of hospital administrator, executive council, district council, regional council and finally, headquarters. Another is that should a physician obtain funds for a research project and then note that it will not succeed, he cannot divert the remainder to another phase of research. He must return it. You can guess what occurs.

One must remember that in previous years

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hospital appointments were without salary, but rather for the prestige (and referrals). Now the specialist is being paid for what had been done gratis.

Hospitals are now getting caught up with the old backlog of elective procedures after almost six years of extended waiting lists. This is true because patients are over the novelty stage and because so many use private insurance schemes to have more personal care in private rooms at Nursing Homes. In addition a very few of the better nursing homes (originally left out of the plan) are being taken in. Moreover, the Royal College laboratories for out-patient or nursing home use, which were not supported by the government, now are back in use. This makes far more desirable the care in the home or nursing home (although the average number of laboratory procedures done by physicians in Scotland is only twenty-seven in a year).

The patient pays for nothing in the hospital including drugs, laboratory, et cetera, and is discharged to the care of his personal physician. Dentistry is free but restricted—it being an advantage financially to pull all teeth and make dentures. Prostheses are free if necessary for livelihood, the wig and toupee now being charged for.

Compensation to the worker is separate from the health service. Public health measures, particularly tuberculosis control, have improved in the past two years, but are far from adequate. Only 7 per cent of expenditure goes to these public health needs. Another problem has arisen in the form of free legal counsel and as a result the Health Service is being sued along with the physician (since he is employed)—even for actions that occurred years earlier. This results in further expenditures, if only for defense.

Presently a study commission is examining the problems and needs of the Health Service and the country. It does not have physicians in its number!

There are many opinions and reasons given by the numerous proponents, opponents, and acceptors of the plan in each of the categories of patient, doctor, government and press, which I shall not elaborate upon. However, there is much dissatisfaction, and this, even in the face of satisfaction to many, indicates that the plan still has not improved adequately even to the British.

Norway

In Norway the initial plan was begun in 1912. This was altered through the years until 1930, when the present general program was brought into effect. This of course was disrupted because of the German occupation. Currently the program is compulsory for the employed. The others may use it electively, although in years gone by there was a ceiling to the income a person could have beyond which he was not permitted to enter into the plan. Now it is available to all. About 80 per cent participate in the insurance scheme.

The plan consists of a number of private insurance companies throughout the country which insure the persons themselves; however, these insurance companies are controlled by the government in that all the policy planning for each of the companies is established through a committee within the government. The health plan is supplanted by taxation for some aspects which will be mentioned later. The manner in which the insurance is paid for is as follows: the employes pay 6/11th of the entire cost; the employer pays 2/11th; the community government, whether it be city or county, pays 2/11th; and the federal government pays 1/11th. This is deducted if the person is an employe; otherwise the entire amount is paid directly to the insurance company by the person involved. Therefore, in effect, he personally pays more. The plan costs approximately \$7.00 per year (not to be compared in purchasing power with the United States). The patient has a free choice of physicians.

There are some other factors, however. Approximately 400 districts are located within the boundaries of Norway. These are similar to what we would call a public health district and within this district there will be at least one physician, who acts as a public health officer. The more sparsely populated districts will have just one man, whereas in the more populated districts there will be more than one. In the sparsely populated districts the man, who is the public health officer, is responsible for the care of the needy and indigent but also may have general practice; conversely his position is full time in a municipal area. He is given a basic salary for this and therefore is selected by the government. However, another physician may come into this district and practice without any government salary but merely by being paid by the insurance company or by the patient himself. If a patient

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desires to see a specialist, he must consult a general practitioner first, who in turn will refer him to the proper specialist. There is a limit to the number of the referrals the general physician may make. As was mentioned, the district physician receives a basic salary. In order to attract some of the men to the rural areas a higher basic salary may be paid in the relatively more undesirable districts. As the officer grows older he may be advanced to the better districts if he so desires. Many prefer to continue in the challenge of the fjords and difficult terrain.

In private practice, there is a charge with a recommended scale. The doctor will see a patient, and then according to the scale, which has been prepared by both the government and the Norwegian Medical Association, he will charge a given amount for a procedure. The patient then pays this particular bill and takes the receipt to the insurance company where he will receive a refund for a portion of what he had been charged. This runs to approximately 75 per cent of the minimum charge. A wealthy person (of which there are few) can be charged more, but is refunded only the percentage of the recommended scale. The charge varies with the procedure and varies in general practice and in the specialty. The specialist will follow the same routine and will charge according to the recommended scale, which is similar to our Blue Shield, but his charges will be higher even if it is the same procedure. This program involves the specialist who is in private practice; however, most specialists attempt to have full-time hospital appointments. Usually they are on a basic hospital salary and are permitted to have approximately six hours a week private practice for which they are paid as noted above.

The patient's choice of the doctor is free and doctor's choice of the patient is free. The patient may change doctors any time just as in the United States. If a patient requires hospitalization, he is then placed in one of the public hospitals owned by the state. He is given full and complete care without charge. The hospitals are all of the ward type. Part of this is paid for by the insurance company; however, the amount it costs the hospital per patient is considerably more, so the remainder is paid for from the general taxation funds. Should the patient desire to go to one of the few private hospitals, he will have the same amount paid by the insurance company

(about \$3.50 a day), but there is no taxation to make up for the remainder as in the public hospitals. Therefore, if the cost is eight or nine dollars a day, as it is in many instances, the patient must make up the difference. If the patient can prove that there was no bed available in a public hospital, then the private hospital charge will be paid in full also by the government.

All laboratory procedures are without charge in the hospital. Outside of that they are not all covered, although there are some special procedures which are partially paid for, such as the x-ray. There is no charge whatsoever for so-called "life saving" drugs as the antibiotics, insulin and any of the drugs which are necessary to maintain one's life. The remainder of them are paid for by the patient. Dentistry is only partially covered. This involves only some reparative procedures and the dental care therefore is lacking to a point. Certain of the prosthesis are paid for, such as hearing aids. This depends upon whether they are necessary for livelihood. During illness the patient will get a percentage of his salary in compensation. This depends upon the type of insurance he has taken out; therefore he must pay more in order to get greater compensation, it being a sliding fee.

There is a good program of public health in Norway. There has been concerted effort to increase the public health measures, and as can be seen by using the district health officers, there is a good grass roots approach. In addition, the state pays separately for the survey and care needed in the control of tuberculosis and of mental disease. Persons requiring hospitalization for these diseases are cared for entirely by the state from a different fund of taxation.

Insofar as our general observations were concerned, the care is relatively good. Certainly the program prevents the catastrophe of losing of all of one's funds; however, there are some problems. The general practitioner does not have available to him hospital or laboratory facilities, so that the care under a general physician is restricted even though he is doing a very good job under the circumstances. If these were to be increased, costs would rise markedly. The doctor status is restricted to a certain point by the government control but it is relatively free. With the centralization of authority, a potential danger of poor administration exists, though excellent now. The fees are established for the doctor, which is a

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potential problem. They are quite fair, however, compared to the other charges throughout the country for other services. The doctors have no objection in that regard; they feel that their particular lot is a good one. However, when one looks at the total comparative picture of Norwegian socialization, one can understand why the doctor feels this way. Currently there is freedom insofar as the total program is concerned. The total effect on medical care has been further spread of medical care including the rural areas. It has helped increase the specialization care but the general practitioner should be given more opportunity.

There are some miscellaneous factors which I think are extremely important to consider. First of all, there is a relative dictatorship by the director's office of the Health Service. He has drug control under his direction. For the sake of finances it has been established that the best drug for the least money is the one which is used. However, there will not be two drugs of the same type made by two different companies. Thus competition is gone. This currently is not a major problem except that it suggests what could happen if a man who did not have the country's welfare at heart were in charge. In addition, the director's office selects three people, from whom one is chosen for any vacancy that occurs in government medicine. Here again a threat, because of the centralization, could arise. There is none at the moment, but the possibility is real. Cheating on time off seems to be a problem which has arisen. In this the doctor is inclined to give a patient an extra day or two off in order to keep him happy. This keeps him as a patient; otherwise he might go to another doctor. This doesn't happen too often but occurs sufficiently frequently for me to have heard it from many men.

There is a shortage of training in Norway for some of the specialties, particularly ophthalmology, by reason of the fact that there are only two medical schools in Norway, one in Bergen, established since the war, and one in Oslo. In Oslo there is an emergency center, so that there is a physician ready and available twenty-four hours a day. The one problem that has arisen from this is that many people who are not true emergencies come to the emergency center due to the fact that they can get a specialist more readily without a referral.

The attitude toward the plan by the patient is good; the patients really seem to enjoy it; they think it is a good plan and hold the doctor in high esteem. The government of course believes it is good but they would like to set up a basic salary for *all physicians*. This was very soundly trounced by the Norwegian Medical Association, however, and for the moment has been set aside. The physicians feel that they have good freedom in their care of patients and look to the plan as being adequate, but with the potential dangers mentioned; the press has nothing to pick at in general. They feel that the plan is very good. In summary, one would feel that this, in so far as a socialized plan is concerned, shows considerable freedom and more possibilities of leverage, and that the only main complaint by the physicians is the centralization within the government.

Sweden

The Swedish plan had a period of indoctrination from the turn of the century until 1930, when a rather inclusive program was incorporated. This was rather close to that of Norway in most respects. There were changes involving drugs and compensations introduced in 1946, but the total compulsory plan was not initiated until January 1, 1955. Thus the effect of this recent innovation will not be noted for some time. Sweden has distinct economic advantages in the Scandinavian sphere through its historic relationships and its attempted neutrality in the wars. These have contributed considerably toward its having better facilities in general than the other countries. Much more could be said in this regard. In summarizing the main features in this paper, I shall have to cover the experience noted in the past twenty-four years of the plan and merely comment on the new compulsory factor. There are a few minor changes, but in reality the inclusion of the entire population is the main one. This was done primarily to get a greater assured total operating budget, but the greater centralization does present possible further dangers. With the new feature the total freedom, of course, is further impaired. It is interesting in this regard to note that the Scandinavian countries have combined to publish a book entitled "Freedom and Welfare." Some criticisms by the medical association, besides those noted above include (1) the compensation features in which some patients can receive more money

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by not working; (2) the poor timing of a total plan, for there are too few doctors and too few beds, which results in too many patients per doctor per day; (3) the fact that it costs less for the patient in the hospital and therefore there are too many admitted.

Before the new ruling about 75 per cent of the country was covered by health insurance. This was (and still is) operated under the same type of plan as that of Norway in which private insurance companies are controlled by a committee within the government. The approximate breakdown of cost is 44 per cent paid by the employe, 27 per cent by the employer and 29 per cent by the local government. The cost per year is approximately \$6.00. This again cannot be compared with the United States, for the greater buying power, lower salaries, et cetera, make it impossible. Again one must note that just as in Norway this insurance pays only for a part of patient care, that the drugs, prosthesis, major portion of individual hospital care, tuberculosis hospitals, mental hospitals, et cetera, are all paid for by the government from taxation. Thus the real cost to the patient is hidden.

The patient may select whatever doctor he chooses, but in contrast to Norway, he may go directly to a specialist. In Stockholm this has resulted in better than 95 per cent of the doctors being specialists or partial specialists. Great Britain physicians in observing this have written a word of warning to their general practitioners.⁶ This trend has worried the Swedish Medical Association. The patient upon being billed for service by either a general practitioner or specialist then pays the sum and brings the receipt to the insurance company where he is refunded a portion of the bill (as in Norway about 75 per cent of the recommended scale). This scale is established by the government in conjunction with suggestion by the Swedish Medical Association.

In addition, the district health officers (there are 600 districts in Sweden) are employed by the government as in Norway and may have private practice in the rural districts. These men must care for the indigent without charge as a result of the basic salary. Government medicine is interested in increasing the number of districts, but the Swedish Medical Association believes this another centralization danger. There is good reason for fear, for although the present medical

director is an excellent man, the one who preceded him was not. In fact, he was praised by the Communists and criticized by the Western bloc physicians who knew him. He has since been removed from another position in India. This has alerted the medical association to potential dangers of centralization.

In Sweden polyclinics have sprung up. These are large clinic facilities staffed by specialists on a salary. They are generally owned by the municipality. The patient may go directly to these clinics, but has no personal relationship. In addition the out-patient departments of the hospitals which are generally large (1,200-1,800 beds) will care for patients. It was most amazing to see the tremendous lines waiting, but understandable when I was informed that in one department alone two surgeons would see 200 patients per day. The morning was for men and the afternoon for women. This figures out (including forty new patients) to as many as thirty patients per hour. Need I say more?

The care of a patient requiring hospitalization is excellent and without charge. He receives drugs, laboratory work, et cetera. As in Norway also he is in wards only. The same financing of insurance plus government funds pays for it. He may be referred back to his general physician, but often returns to the specialist and out-patient department. There are few private hospitals. Those that I visited were excellent but are not covered other than by insurance—unless the patient can prove that no government hospital bed was available.

The life-saving drugs are paid for; those that are essential but not live-saving are partially covered; and the remainder are not paid for. Prostheses are covered if essential for livelihood. Dentistry of a reparative nature is the only type covered and compensation varies with the job and the insurance. Public health measures, including special funds for tuberculosis and mental hygiene care, are excellent.

General summary of effect of the plan would be that the care is good under the circumstances but that there are too many patients seen in too short a time. The intimate doctor-patient relationship is diminishing, but hospital attention and facilities are excellent. The doctor is in high esteem and receives very adequate recompense. His freedom in private practice is essentially unimpaired, but if he is a specialist and on a

staff, he is salaried. The usual patient has learned to wait in view of the superspecialization in the major centers, but a considerable number miss the personal touch. Those who have sufficient income can still get what they want, however. The government and the press currently are satisfied, but the former appears to encourage more salaried physicians. The medical association is not pleased with the compulsion, the great number of free and partially free drugs, the relatively inequitable compensation during illness in some cases, the over-reimbursement to the patient of certain procedures, the superspecialization and trend toward polyclinics, and finally the overcrowded hospitals when convalescent hospitals would help relieve the load considerably. It may be noted also that the number of students will stay high because of prestige, but that the young physician in a specialty will be a junior man for many years and on a salary.

Denmark

Perhaps the most complicated of the socialized plans in Scandinavia is that of Denmark. This stems primarily from the long history and growth of the plan, but also is due to the population distribution and geographical history. In actuality farmers began forming "Sick Clubs" in the 1850's which were set up in the manner of insurance companies. In the 1880's parliament discussed subsidization of the program to a degree, and in 1892 the first government plan was introduced. The current program was established in 1932, at which time all social laws were co-ordinated including sickness compensation. The German occupation of course interferred with the total picture of the country, but currently the scheme has two distinct modes of implementation—one type involving Copenhagen (about one quarter of the entire country's population) resembles the British scheme—the other is like that of Norway and Sweden and covers the remainder of the country. The plan is compulsory for the employed, the manner of payment being the same as in the other two Scandinavian countries. Here also the employe pays about half the cost (\$9.00 a year—again not comparable, for it includes all children under fifteen years). There is a limit of income beyond which one may not enter into the government scheme. Presently about 75 per cent of the population is covered by this plan. The insurance companies are gov-

ernment controlled; however, there is also subsidization from taxation.

The general plan, exclusive of Copenhagen, is like the other Scandinavian schemes in that the patient has a free choice of doctor and the physician is paid on a fee for service basis. One major difference is that the doctor fills out one of the dozens of colored forms for a particular insurance company and submits them monthly for full scheduled payment. The patient must see a general physician first, thus needing a referral to consult a specialist. There is a limit to the number of referrals a general physician can make in a year. A person covered by private insurance may go directly to the specialist but the company will pay general practitioner rates.

The country is divided into twenty-two districts where there is at least one public health officer and sometimes two to three assistants. Government medicine desires these men to be specialists in the field, but the Danish Medical Association wants them to be general physicians as most of them are. They have the duty of public health measures and care of the indigent, but also may have a private practice, thus the usual procedure is to buy one—a difficult problem for young men. The hospital system involves a central hospital in each county (250-400 beds) with a few mixed hospitals (90-100 beds). Occasionally there may be some specialties lacking in central hospitals. The mixed hospitals include medicine and surgery—with the surgeon always being the director. The laboratories of all the hospitals (and a central laboratory in Copenhagen) are open to the general physicians. All life saving drugs are paid for; those determined to be necessary or important are covered $\frac{2}{3}$ and the remainder are paid for by the patient. All hospital expenses are paid through the Sick Club, the local government and the state. Dental care is not complete, being only reparative. Prostheses are paid for by insurance if needed, although hearing aids (e.g.) are paid for by the government.

The chief of a specialty in a county or municipal hospital may see private patients by referral as well as receive the basic salary for his hospital work. The assistants are permitted to see patients on their time off, but not at the hospital. The government has established a maternity and child care program for which the general physician receives fee for service. This includes three free obstetrical examinations preceding delivery

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for any pregnant woman and free pre-school and school examinations. In addition, he is paid for making out health certificates.

The Copenhagen program (includes Fredricksberg) is completely different. In this instance the Sick Clubs appoint city district physicians who then establish a panel. Other physicians are permitted to practice, but there is no source of patients—thus, in effect, all are employed by the Sick Clubs. All must be members of the Danish Medical Association. There is a free choice by the patient within the district, but this limitation plus the fact that the patient signs up for a year on the doctor's panel hinders liability. The doctor receives about \$3.50 per head per year for 2,000 patients, but must care for those in the family under fifteen without charge. He may have another 500 patients, but is paid only about \$.30 per head for these. The general physician does *not* make calls between 7:00 p.m. and 7:00 a.m. for there are special "night doctors" employed by the Sick Club. This group is drawn upon for any "day doctor" vacancies that may occur in a district. The newest man in a district gets what is left over from the others—in other words the "rejects." Fortunately the usual co-operation amongst patients is quite good.

The specialist has the same situation as his associate in the county hospitals except for the eye, ear, nose and throat specialists who are assigned 30,000 people (whom they may never see) at a rate of about \$.15 per year per patient.

This series of apparently confused adjustments has many minor sidelights, including the fact that some physicians still collect 10 to 70 dollars in advance per year from private patients for tending their needs that year. Some comments and observations to be noted were that in the per capita plan the general physician tended to send too many to the hospital to get them out of his hair, whereas in the fee for service program he tended to see them too often. There are mechanisms of check and counter check in this regard.

The tuberculosis, mental and child and maternal care are paid from tax sources in Denmark also. There is governmental pride in the extreme narrowing of net income range within the country and some of the doctors think "it is nice that the people do not pay." Currently the people are satisfied, having known nothing else; the doctors are complacent except for a few; and the government is currently considering proposing full com-

pulsion. A commission of twenty men (including three from the medical association and two from government medicine) is meeting in studying this possibility. In reality the medical association-government-press relationships are excellent.

As one doctor said, "We are far closer to a true communist state than the Soviets."

Summary

Summarizing the total trend of socialized medicine in Europe, one must keep in mind that the historical, geographical and traditional factors are far different from ours. In addition, the needs, habits and finances are completely at variance. Therefore one cannot begin to compare with nor apply their experience to these United States. We in effect are the equivalent of forty-eight countries from the standpoint of size, population, complexity and administration.

There was a distinct need for further medical care, otherwise the various programs would not have come into effect. The only true full blown political maneuver evidenced was that of Great Britain. But even in that instance the initial program was thirty-seven years old. It was interesting to note that similar schemes for the employe group are present in every country I visited—Holland, Switzerland, France, Italy, Greece, et cetera and that Germany (the originator) still has a program. In East Germany I found the Russian plan woefully inadequate, with physicians slipping to the West regularly. This fact, together with the very definite turn of the world to the United States for leadership in medicine, indicates that many routes are sought to attain the same level of medical care enjoyed by our country.

Thus one notes a difference in attitude and acceptance, plans and facilities of medicine in each of the countries. However, one singular fact of full freedom remains in that private insurance for private care beyond each national program is definitely utilized and in many instances has increased markedly!

It has become quite evident that free enterprise has brought better general medical care, facilities, and future to all peoples in this country than is present in any of the "ideal socialization schemes," but we have not a sufficiently comprehensive program to offset medical financial catastrophe

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MINNESOTA MEDICINE

Radical Treatment of Brain Abscess

HAROLD F. BUCHSTEIN, M.D.
Minneapolis, Minnesota

TREATMENT of brain abscess in the pre-antibiotic era was necessarily governed by the physician's inability to combat directly the most important aspect of the patient's disease, the microorganism concerned. Only the patient, through the antibacterial mechanisms of his own body, could discourage and destroy the pathogenic organism. Thus, in a very real sense, the patient had either to overcome his own disease or to die. Under these circumstances the treatment of brain abscess was one of the more dismal aspects of neurosurgery.

The accepted mode of treatment was to wait until the abscess had become chronic and then, and then only, to evacuate its contents by drainage.

If drainage was undertaken too soon, the surgeon encountered not a firm, well-defined abscess wall but an area of diffuse cerebritis and necrotic tissue. Mechanical interference in such a situation resulted only in spreading of the infection, meningitis and death. On the other hand, the increased intracranial pressure resulting from cerebral edema in the hemisphere harboring an abscess frequently resulted in prolonged suffering, loss of vision and even death before the abscess was deemed ready for drainage. The selection of the proper moment for drainage was a problem requiring the nicest clinical judgment.

A number of technical methods were devised to facilitate the drainage of brain abscesses. Dandy's air studies (pneumoencephalography and ventriculography) permitted more accurate localization of the lesion, which in turn permitted the use of minimal skull openings in approaching the abscess. The use of a large craniotomy, as might be the case when tumor rather than abscess was suspected, permitted bulging of the brain with formation of hernia cerebri and almost always ended in disaster. Neurosurgical opinion came to favor the placing of the approach to an abscess

in a clean field rather than through an infected area such as the mastoid.

Most surgeons used drains of one sort and another extending from the abscess cavity to the surface. Dandy pointed out the traumatic potentialities of the draining process itself and advocated single or repeated tapping through a brain cannula as sufficient in most instances. Others (Grant), devised atraumatic methods of introducing drains. Such efforts were greatly facilitated by the suggestion of Kahn that a radiopaque material (Thorotrast) be introduced into the abscess cavity following its initial tapping. Serial x-ray studies then permitted following the lesion's course with respect both to its size and position. It was seen that even a deeply placed abscess would migrate toward an overlying defect in the skull provided a sufficiently large opening was made.

King developed a more aggressive drainage technique in which an area of cerebral tissue between the abscess and the surface was removed and the abscess itself was uncapped. The rest of the abscess cavity was then everted by the pressure of the brain behind it. This marsupializing technique did not achieve wide employment because it involved such extensive trauma to the brain (and probably also because it was so time consuming).

Finally, it may be noted that many surgeons had had the occasional experience of removing an encapsulated intracerebral lesion, presumably a tumor, only to find upon sectioning the mass that it was actually an old chronic brain abscess. Ballance, as early as 1912, suggested that this was the ideal treatment for brain abscess. Others, including Dandy, felt that the procedure was potentially too dangerous to be deliberately undertaken.

The end results of treatment of brain abscess by these methods left much to be desired. Many patients succumbed to their infections before surgical drainage could safely be undertaken and

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half or more of those operated upon died as well. Surgeons have exhibited an understandable reluctance to publish their over-all results but many have admitted their inability to match the results of MacEwen of Glasgow, who in 1893 reported survival of eighteen of nineteen patients in whom an abscess was drained. This is perhaps a reflection of their lack of MacEwen's fortitude in waiting out the development of a truly chronic stage of the abscess before drainage.

Less generally appreciated was the high incidence of neurologic residues, particularly of convulsive seizures, after the "successful" treatment of brain abscess. After an abscess has been drained and heals, there remains a mass of fibrous and necrotic tissue embedded in the brain and frequently connected with cortical areas which is practically a classical example of an epileptogenic scar. The development of fits has been reported to occur in one-half of those who survive drainage of a brain abscess.

This residual core of the healed abscess was also a potential source of reinfection and many ostensibly cured patients returned a few months later with a recurrence of activity in their abscesses.

With the arrival of effective antibiotic drugs, dramatic and welcome changes occurred in the incidence, behavior and treatment of brain abscess, as in so many other fields of medicine.

Most striking has been the great reduction in the incidence of brain abscesses through the effective control of their precursors, namely, sinusitis, mastoiditis, pulmonary infections and infected craniocerebral wounds. This hardly requires further elaboration.

The use of antibiotic drugs has also considerably altered the clinical picture of brain abscess in that the symptoms of the infection are often held in check and the patient no longer presents the toxic appearance formerly seen. Bucy early reported a group of patients in whom drug therapy alone resulted in a subsidence of symptoms and presumably in healing of the abscess. That such an improvement of the patient's clinical status is an unreliable indicator of the chemical cure of a surgical lesion is illustrated by the following experience:

Case 1.—A thirty-four-year-old woman had had a mastoidectomy following scarlet fever at age five. A post-auricular abscess developed and had drained in-

termittently since. Repeated suggestions that the lesion be eradicated by radical surgery were refused. The patient was admitted to the hospital by her obstetrician in January, 1954, complaining of severe headache. Her temperature was elevated. Two weeks previously a large post-auricular abscess had been drained. She was at term but not in labor. Under chemotherapy the headache and fever subsided, and the patient was discharged from the hospital after three days.

She was readmitted a day later complaining again of severe headache. Her temperature was 100 degrees F., and there was post-auricular drainage. Under chemotherapy the headache and fever again subsided and the patient was again discharged.

She was readmitted in labor nine days later and delivered a normal infant. On the second post-partum day her temperature rose and headache returned. By the fourth post-partum day her headache had become intense. At this point her condition deteriorated rapidly and within a few hours she was unresponsive, her pupils dilated and fixed. There was no choked disc.

At this point mastoidectomy was carried out and a large temporal lobe abscess was drained through the mastoid wound. The patient died a few hours later. Post-mortem examination showed the ventricles to be filled with purulent material. The brain abscess had apparently ruptured before drainage.

Of greatest interest and value to the neurosurgeon has been the wider latitude of intracranial maneuvers rendered possible by the use of antibiotic drugs. Whereas formerly much of the surgeon's effort was directed at avoiding spreading of the infectious process into uncontaminated areas he now finds himself able to open the skull widely and to deal with the abscess much as he would with a tumor. The object of surgery has become the total removal of all infected cerebral tissue rather than simple drainage of the abscess.

Early efforts at deliberate complete excision of brain abscess were carried out in two stages. Vincent tapped the abscess in a subacute stage and then several weeks later returned and enucleated the entire unopened mass. Kahn allowed the unopened mass to migrate toward an overlying decompression and later drained or removed it. Groff and Grant devised a modification of Vincent's method in which the abscess was tapped and then immediately enucleated if found to be thick-walled. If the abscess was thin-walled its removal was postponed until a later date. In all of these methods it was planned to remove the abscess as an intact, unopened mass.

Fincher appears to have been among the first to advocate resection of the whole infectious

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process and of any remnants of involved brain tissue at an initial operation which was terminated by primary wound closure. He reported five cases successfully treated in this manner in 1946. These patients were, of course, all subjected to intensive chemotherapy both before and after the surgical procedure.

LeBeau also has demonstrated that brain abscess of all stages of development can be successfully attacked and removed in a piece-meal fashion and the wound tightly closed. Such a method, when successful, is not only curative of the abscess, but results in a marked shortening of surgical morbidity as compared with more traditional drainage methods. It seems reasonable to assume that there will also be a significant reduction in neurologic sequelae, particularly convulsive seizures.

Two cases treated last year illustrate the application of this method.

Case 2.—Three months prior to his admission to St. Barnabas Hospital a 17-year-old boy, while sliding had been struck in the region of the left eye by the limb of a tree. Marked ecchymosis and edema of the eyelids developed and as this subsided diplopia was noted on gazing to the left. Improvement followed under chemotherapy. One month prior to admission the boy began complaining of left-sided headache, fatigue, and uncinate seizures (olfactory hallucinations). When he began to vomit he was referred to a neuro-psychiatrist as a functional problem.

Under observation in the hospital the patient developed blurring of his optic disc margins, a febrile course and a moderately stiff neck. The spinal fluid was under increased pressure and contained 1,000 cells per cubic millimeter, 90 per cent being polymorphonuclear. The sedimentation rate was 56 millimeters in one hour. He was placed on intensive chemotherapy.

On April 4, 1953, a ventriculogram indicated a mass in the left temporal region and craniotomy was immediately undertaken. As is our usual custom, a circular craniotomy was carried out employing a hole saw of 1½-inch diameter. Because the brain was under considerable tension, the abscess was first drained through the unopened dura. This resulted in sufficient reduction of pressure to permit wide dural opening and the exploration of a tract through the brain down to the abscess itself, which was found as an irregularly nodular sac measuring about 2 by 4 centimeters and having a stalk-like extension which ran forward to the region of the superior orbital fissure, that is, the posterior margin of the orbit. Apparently a twig had penetrated not only the orbit but the brain itself through the superior orbital fissure. The mass was mobilized and removed in one piece following which all of the softened brain about it was sucked away. The wound was then closed without drainage. The free bone flap

was replaced so as to leave the patient without a defect in his skull. Cultures of the brain abscess yielded a coagulase positive strain of *Staphylococcus aureus* which was sensitive to terramycin and aureomycin. The patient was placed on intensive therapy with these drugs plus penicillin.

The patient became afebrile in nine days and chemotherapy was discontinued in fourteen days. He was discharged on the sixteenth postoperative day at which time his wound was well healed and he was free from all complaints except a mild residual diplopia on left lateral gaze. He has remained in good health.

Case 3.—A sixty-three-year-old flour miller with bilateral chronic ear infections of many years' standing suddenly developed fever and right ear pain. Under treatment with aureomycin he improved but a week later the pain returned and the patient had a generalized convulsion. Upon admission to Northwestern Hospital under the care of Dr. R. Priest, the patient was obviously ill and appeared mentally confused. The right ear canal was draining purulent material profusely. The spinal fluid was under normal pressure and contained 79 cells per cu. mm., 85 per cent being mononuclear.

On the following day radical mastoidectomy was performed on the right side. A wide area of dura was exposed but no evidence of dural involvement by the infection was seen.

Following this procedure the patient was much improved but continued to exhibit apparent confusion which was actually the result of a receptive aphasia. Neurologic examination gave normal findings. It was felt that there was insufficient evidence to justify a diagnosis of brain abscess and continued chemotherapy was advised.

Under observation the patient became disoriented as to time and place. Re-examination of the spinal fluid showed its cell count to have returned to normal levels (3) and to be still under normal pressure.

On June 10, 1953, a pneumoencephalogram indicated a mass in the left temporal region. By this time the left ear canal was also draining pus profusely. Left radical mastoidectomy was performed on June 12 and again the dura was not obviously diseased.

At the conclusion of the mastoidectomy the temporal lobe was explored through a separate incision. A 2-inch circular craniotomy was made with a hole saw. The exploring cannula encountered a soft area just above the petrosal ridge from which 45 cc. of foul-smelling pus was aspirated. Following this the dura was opened widely and soft brain tissue was sucked away until a poorly defined abscess capsule was encountered. This was attached to the inner surface of the dura just above the mastoid. All of the purulent material and obviously softened brain tissue were sucked away.

Following this the wound was closed without drainage, the free bone flap being replaced in the wound. The patient was given aureomycin intravenously during the operation, and postoperatively received penicillin and streptomycin also. *Aerobacter aerogenes* was cultured from the left ear canal, the left mastoid and the brain abscess.

The patient made a satisfactory recovery without

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complication of any sort, his wound healing promptly. His aphasia improved progressively but was still apparent when he was discharged from the hospital on the ninth postoperative day. Chemotherapy was continued at home for two weeks. After several months his aphasia had improved sufficiently to permit a return to his regular work. The patient has remained well.

A number of clinical aspects of brain abscess in the present day are illustrated by the foregoing cases.

In two instances the abscesses developed as complications of chronic ear infections, but in each case the symptoms of the abscess were at first so minimized by the use of antibiotics that the diagnosis of brain abscess was not seriously entertained until the patient was in a rather critical state, much too critical in the first instance. The chronically draining ear remains a serious threat to the patient and deserves appropriate surgical as well as medical treatment.

In the third case the rather unusual circumstance of penetration of the brain through the orbit by a foreign body, a twig, led to a temporal lobe abscess. Here again chemotherapy so altered the clinical course of the disease in its early stages that when it became chronic, its symptoms were at first attributed to functional mechanisms rather than to the seemingly minor injury.

In both instances in which the abscess was approached through a clean field and the entire infected area of brain, together with the abscess, was radically removed, a happy result followed. With the patients under intensive systemic chemotherapy before, during and after operation, healing of the wound was prompt in each instance and there has been no hint of recurrence in over a year. We have not felt it wise or necessary to instill drugs locally in these wounds since some of the drugs are irritating to the brain, in high concentrations, and since effective blood and spinal fluid levels are produced by systemic administrations.

The relatively brief and uncomplicated post-operative courses of these patients is in sharp contrast to the prolonged period of drainage and dressings often encountered under former methods. The prompt wound healing in these cases is the more remarkable in view of the replacement of free bone flaps in wounds which were almost certainly infected. Such a maneuver in earlier days would almost inevitably have led to

osteomyelitis of the flap requiring its subsequent removal finally to achieve wound healing. The absence of disfiguring scars and of skull defects, while not of prime importance, is certainly a worth-while consideration. Finally, one can hardly doubt that these patients have much less cerebral scarring than do those in whom a drained abscess is allowed to heal and remain in the brain.

The over-all results of such a radical method of treating brain abscess can, of course, not be judged from a few cases. At present brain abscesses are encountered so seldom as to make the collection of an adequate series of treated cases a difficult matter for a single surgeon. A recent report from the Massachusetts General Hospital gives some indication of the superiority of similar methods. Thirty-one patients with brain abscess were treated during the years 1936-1940, with twenty-five deaths (80 per cent). In the years 1946-1950, however, only ten of twenty-nine patients died (34.5 per cent), and none of these from spread of infection at time of operation. Many of these patients were treated by excision of the abscess.

Summary

The intensive systemic administration of suitable antibiotic drugs permits more radical surgical treatment of brain abscess, the aim of which is the complete excision of the infectious intracranial process followed by primary closure of the wound. Such a method not only cures the abscess but results in a significant reduction of morbidity and should result in a reduction in such sequelae as convulsive seizures and recurrent abscesses.

The advent of such a method may finally permit our approaching Macewen's optimistic opinion voiced in 1893 that ". . . there is no cerebral affliction more amenable to surgical treatment, and none which offers better results."

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A Study of Cancer Mortality in Minneapolis, Minnesota

F. G. GUNLAUGSON, M.D., M.P.H.,
JEAN ROBERTS, M.S., and
KARL R. LUNDEBERG, M.D.
Minneapolis, Minnesota

CANCER ranks second only to diseases of the heart as a cause of death throughout the United States. In 1953 it accounted for one out of each six deaths reported for Minneapolis, taking a toll of 973 city residents—nearly four times as many as were killed in accidents that year.

The crude death rate from cancer continues to rise even though early diagnosis with prompt and adequate treatment could prevent many of these deaths and the suffering preceding them. The Public Health Service cancer morbidity surveys in 1937-1939 and again in 1948-1949 for ten large cities in the United States—Atlanta, New Orleans, Birmingham, Dallas, San Francisco, Denver, Chicago, Detroit, Pittsburgh and Philadelphia—showed that in these cities only half of the new cases were diagnosed while the cancer was still localized and that two out of five patients with newly diagnosed cancer would die within one year unless earlier diagnoses are made.¹

While information on the incidence of cancer in Minneapolis is not available, the Minnesota Health Department Cancer Study² showed that, in 1950, 68.7 per cent of the hospital admissions for treatment of cancer were newly diagnosed cases. If this statewide proportion held true in Minneapolis that year, there would have been 1,390 new cancer cases among the 2,023 known to have been hospitalized for treatment of this disease. On this basis, in 1950 eleven new cases would have been diagnosed here for each seven deaths from cancer.

Local Study

Purpose.—In order to determine in general what progress is being or could be made in the control of cancer in Minneapolis, a study of local cancer mortality data was undertaken. This

Dr. Gunlaugson is Director of Preventable Disease Control, Minneapolis Health Department; Miss Roberts is Director of Records and Statistics and Dr. Lundeberg is Commissioner of Health, of the Minneapolis Health Department.

analysis was planned to find out how much of the apparent increase in mortality from this disease is real; what changes have occurred within the past ten years in the death rates at various ages and for various sites of cancer; and what occupational groups are principally affected here.

Sources and Methods.—The information used in this study was limited to that from the death certificates. Resident data are used whenever available to show the present status of cancer mortality here. Since information on cancer deaths before 1944 is available only by place of occurrence, comparisons with previous years is limited to these data which will include some non-residents brought here for terminal care.

The standard international classification of causes of death was used throughout. Insofar as is known, the comparability of the total figures for malignant neoplasms was little affected by the various decennial revisions until the sixth revision which was adopted for use here in 1950. In this revision for the first time leukemias and lymphosarcomas, including Hodgkin's disease, were made part of the neoplasm group. This would have increased the number of deaths from cancer by about 5 per cent. However, the change in the method of selecting the underlying cause of death would have reduced the number reported as due to cancer. The net effect of the classification changes was a reduction of about 1 per cent.³

Findings

General Trend.—The over-all death rate from cancer for residents and non-residents in Minneapolis nearly trebled between 1900 and 1940—rising from 59.2 deaths per 100,000 population in 1900 to 171.6 in 1940.

During the past ten years the cancer mortality rate for city residents rose from 149.0 in 1944 to 183.4 in 1953, an increase of 23 per cent. Much of this increase is due to the increased number of aged persons in the population. Be-

CANCER MORTALITY IN MINNEAPOLIS—GUNLAUGSON ET AL

TABLE I. CANCER DEATH RATES BY GEOGRAPHIC AREA IN 1950

| States in the Geographic Area | Cancer Death Rate per 100,000 |
|-------------------------------|-------------------------------|
| New England | 176.3 |
| Middle Atlantic | 170.4 |
| East North Central | 152.1 |
| West North Central* | 149.1 |
| Pacific | 139.6 |
| West South Central | 108.7 |
| South Atlantic | 106.5 |
| Mountain | 104.8 |
| East South Central | 102.8 |

*Includes Iowa, Kansas, Minnesota, Missouri, Nebraska, and North and South Dakota.

tween 1940 and 1950, while the entire population here increased 6 per cent, the number of persons sixty years and over gained 36 per cent, and those under fifteen years, 18 per cent. A very small part of the increase may be due to the change in classification of causes of death.

The United States and Minnesota increases in cancer mortality are similar but more gradual than those for Minneapolis. The United States rate has increased from 64.0 per 100,000 in 1910 to 144.7 in 1953. During that period Minnesota rates rose from 67.4 to 158.5.

Urban-Rural Differences.—The cancer death rates have been markedly higher in urban areas of the United States—particularly cities of 100,000 or more population—than they have in rural communities. In 1940 if the differences in the age distribution of the population are removed, cancer death rate for the urban areas was 137.6 compared with 95.5 in the rural communities.

Geographic Differences.—The cancer mortality rates differ widely in the various sections of the country. Rates are highest in the northern states, particularly those in New England, where in 1950 there were 176.3 cancer deaths per 100,000 population—and lowest in states in the east south central section with a rate of 102.8, as indicated in Table I.

While part of these differences may be due to variations between regions in the proportion of adults in the population, recognition and reporting of the disease must be important in producing such widely differing death rates as the 69.4 for New Mexico and 179.6 for Massachusetts.³

Comparison with Other Large Cities.—In general, among the twenty-five largest cities of the United States with populations over 400,000 in

TABLE II. CANCER MORTALITY BY AGE, MINNEAPOLIS RESIDENTS, 1951-1953

| | 1951-53 Cancer Deaths | | Annual Cancer Death Rate per 100,000 Pop. | | Per Cent of Deaths From All Causes Due to Cancer | |
|---------------|-----------------------|--------|---|--------|--|--------|
| | Male | Female | Male | Female | Male | Female |
| All Ages | 1346 | 1414 | 180.5 | 172.5 | 14.9 | 20.1 |
| Under 20 yrs. | 23 | 17 | 10.8 | 7.9 | 3.4 | 3.7 |
| 20-29 | 14 | 17 | 10.5 | 11.5 | 9.2 | 19.5 |
| 30-39 | 26 | 50 | 25.1 | 43.2 | 10.9 | 29.8 |
| 40-49 | 87 | 122 | 92.5 | 110.8 | 15.7 | 35.4 |
| 50-59 | 217 | 284 | 232.1 | 273.6 | 16.9 | 36.9 |
| 60-69 | 547 | 554 | 1433.3 | 1087.8 | 14.2 | 14.5 |

1950, those in the north tended to have higher cancer death rates than those in the south. The only exception to this was Detroit, a northern city, with the fairly low rate of 144.5. The rates ranged from 199.3 in Seattle to 122.5 in Dallas. There was no apparent tendency for the larger cities to have the higher cancer death rates. Minneapolis ranked seventeenth in the population and sixteenth in the size of the cancer death rate among these cities.

Age on Death.—Cancer mortality in Minneapolis increases rapidly with age from twenty years on for males and thirty years on for females. During the years from 1951 through 1953, the average annual cancer death rate for Minneapolis male residents ranged from eleven deaths per 100,000 for boys under twenty years of age to 1,433 deaths from this cause among men seventy years of age and older (as shown in Table II). The rates for females ranged from eight deaths per 100,000 girls under twenty years of age to 1,088 deaths per 100,000 women twenty years of age and over.

The rates for women are less than those for men, particularly from sixty years of age on, but slightly greater in the ages from thirty to fifty-nine years. The differences in these rates, however, were so small that they could easily be due to chance alone.

Since the death rate from all causes shows a similar increase with age, the proportion of these due to cancer shows more clearly the relative impact of this disease with age. For men of all ages, fifteen out of each 100 deaths were from cancer compared with twenty out of each 100 deaths among women. Except for the very young and the very old, women appear more likely—if they die between the ages of twenty and fifty-nine—to die from cancer than do men.

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TABLE III. CANCER MORTALITY BY AGE IN
1941-1943 AND 1951-1953.
ALL CANCER DEATHS OCCURRING IN MINNEAPOLIS

| | No. of Cancer Deaths | Annual Cancer Death Rate* | | |
|----------------|----------------------|---------------------------|-----------|-----------|
| | | 1951-1953 | 1941-1943 | 1951-1953 |
| Males | | | | |
| All Ages | 1541 | 1433 | 206.6 | 203.7 |
| Under 20 | 57 | 39 | 26.3 | 19.3 |
| 20-29 | 14 | 27 | 10.4 | 22.7 |
| 30-39 | 34 | 33 | 32.6 | 30.8 |
| 40-49 | 92 | 105 | 97.8 | 97.0 |
| 50-59 | 213 | 249 | 227.9 | 280.6 |
| 60-69 | 472 | 425 | 688.2 | 882.6 |
| 70 years on | 659 | 555 | 1727.1 | 1782.8 |
| Females | | | | |
| All Ages | 1678 | 1498 | 204.8 | 193.6 |
| Under 20 | 51 | 27 | 23.5 | 13.2 |
| 20-29 | 26 | 23 | 17.5 | 15.4 |
| 30-39 | 69 | 71 | 59.4 | 56.2 |
| 40-49 | 163 | 204 | 147.9 | 173.5 |
| 50-59 | 327 | 328 | 314.9 | 379.7 |
| 60-69 | 433 | 365 | 592.8 | 694.5 |
| 70 years on | 609 | 480 | 1195.5 | 1286.1 |

*Rates per 100,000 population. Deaths include residents and non-residents.

**If the 1951-1953 age specific rates were applied to the population in this period, the adjusted rate for men would be 181.6 per 100,000 population and for women 174.9.

TABLE IV. PRIMARY SITE OF CANCER.
DEATHS IN MINNEAPOLIS FROM MALIGNANT NEOPLASMS,
1941-1943 AND 1951-1953

| | Number of Cancer Deaths | | Annual Cancer Death Rates Per 100,000 Pop. | | Per Cent Change from 1941-43* | |
|--|----------------------------|---------|---|----------|----------------------------------|-------|
| | 1951-53 | 1941-43 | 1951-53 Rates* | | | |
| | | | Crude | Age Adj. | | |
| All Sites | 3219 | 2931 | 205.7 | 178.0 | 198.4 | -10.3 |
| Buccal Cavity | 61 | 60 | 3.9 | 3.2 | 4.1 | -21.9 |
| Digestive System | 1253 | 1253 | 80.1 | 67.0 | 84.8 | -21.0 |
| Respiratory System | 249 | 165 | 15.9 | 13.8 | 11.2 | +23.2 |
| Breast | 334 | 283 | 21.3 | 19.2 | 19.2 | 0 |
| Genital Organs (Cervix, Uterus, Prostate, etc.) | 456 | 503 | 29.2 | 25.3 | 34.0 | -25.6 |
| Urinary Organs | 180 | 178 | 11.5 | 9.7 | 12.0 | -19.2 |
| Other Sites and Lymphoblastomas | 468 | 355 | 29.9 | 26.8 | 24.0 | +11.7 |
| Leukemias | 218 | 134 | 13.9 | 13.0 | 9.1 | +42.9 |

*The crude or unadjusted 1951-1953 rates are based on the 1950 population, the age-adjusted rates were obtained by applying the age specific 1951-1953 rates to the 1940 population.

The proportion of male deaths from cancer increases steadily from 3.4 per cent for boys under twenty to a peak of 18.9 per cent among men aged sixty to sixty-nine years. Among women, the proportion of all deaths reported as due to this disease increased from 3.7 per cent for females under twenty to a high of 36.9 per cent among those dying at ages fifty to fifty-nine years.

In comparing the cancer death rates for the 1941-1943 period with those for the 1951-1953 period, the total number of deaths occurring in the city were used and leukemia and Hodgkin's disease included with the malignant conditions for both periods. The crude death rate from cancer for males on this basis in 1951-1953 was 206.6 per 100,000 population compared with 203.7 in 1941-1943. Among women the rate increased from 193.6 in 1941-1943 to 204.8.

If these rates were adjusted to eliminate the sharp increase in the proportion of children and persons sixty years of age and older in the population between 1940 and 1950, the cancer death rate is found to have decreased 10 per cent in the past decade—a significant drop not likely to be due to chance alone. Applying the 1951-1953 cancer death rates for each age group to the 1940 population, we find that if the 1951-1953 rates had existed in the earlier period, only 182 men per 100,000 population would have died from this disease instead of the 204 who did and 175 rather than 194 women per 100,000 would have died from cancer.

As shown in Table III, the death rates for both men and women decreased slightly in the ten-year period for persons fifty years of age and over. The only significant decrease, however, is that for men aged sixty to sixty-nine years.

National Office of Vital Statistics reports show that in the United States from 1900 to 1935 there has been a steady increase in the cancer death rates for persons of all ages, the greatest being for those over forty-five years with relatively smaller gains in the younger ages. Since 1935 there has been a leveling off of the age-adjusted death rates which indicates that the increase in the total cancer death rate in recent years is due to the growing proportion of persons in the older age groups.³

Primary Sites of Cancer.—The digestive system is the most frequent primary site of cancer. Among Minneapolis resident deaths during the past three years, 39 per cent of those from cancer were ones in which the malignancy was reported as having started in the digestive system—usually

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in the stomach or large intestine. Next in order were malignant neoplasms of the genital organs (uterus, prostate, et cetera) which accounted for 16.3 per cent of all cancer deaths; breast, 10.5 per cent; respiratory system, 8.5 per cent; urinary organs, 5.4 per cent; leukemias, 5 per cent; and all other sites, including lymphoblastomas, 14.2 per cent.

An improvement is evident in Minneapolis during the past ten years in the age-adjusted cancer death rates for all sites except leukemias, lymphoblastomas and malignancies of the respiratory system (Table IV). There were marked decreases in the rates for the buccal cavity, digestive system, urinary organs, and genital organs.

Early detection and treatment are essential if any real progress is to be made in the control of this disease. The survival of the patient depends largely on the stage of disease at the time of diagnosis. The more accessible the site to direct examination, the greater the opportunity for early discovery. Public Health Service surveys in the ten large cities in the United States showed that, excluding cancer of the skin, 48.3 per cent of all cancer in females and 22.6 per cent in males is located in accessible sites.

Occupation.—Occupational cancers are almost the only known cancers for which a definite cause is known and for which control is possible through elimination or modification of the carcinogenic substance or protection of the worker.

During the past 179 years many different carcinogenic substances affecting the skin, lung, bladder and/or bone marrow have been identified. According to Hueper,⁴ these include in order of discovery:

| | |
|-------------------------|----------------------------|
| soot | anthracene oil |
| arsenic | betel nut |
| paraffin oil | extreme dietary deficiency |
| shale oil | creosote |
| pitch and tar | benzol |
| some crude oils | uranium |
| sun (ultra violet rays) | radioactive rays |
| aromatic rays | chromates |
| roentgen rays | nickel carbonyl |
| radium | asbestos |
| Schistosoma hematobium | tar fumes |

Breslow⁵ has found a high incidence of lung cancer among certain occupations in which there is a continuing exposure to metallic particles, fumes and products of metallic combustion.

The increasing use of many of these substances

TABLE V. USUAL OCCUPATION FOR ALL RESIDENT CANCER DEATHS IN MINNEAPOLIS, 1953

| Type of Occupation | Number of Deaths | | Death Rate Per 100,000 in Occ. Gp. | |
|-----------------------------------|------------------|--------|------------------------------------|--------|
| | Male | Female | Male | Female |
| All Types | 366 | 423 | 147.2 | 154.9 |
| Laborers | 38 | 1 | 405.5 | 207.4 |
| Skilled Trades | 85 | 6 | 271.9 | 373.1 |
| Semi-Skilled | 31 | 23 | 115.5 | 176.0 |
| Managers, Proprietors (with farm) | 70 | 6 | 368.7 | 185.1 |
| Professional, Technical | 35 | 16 | 224.3 | 141.2 |
| Private Household Employees | 0 | 4 | — | 107.5 |
| Other Service Employees | 34 | 10 | 308.1 | 81.4 |
| Sales | 38 | 6 | 257.7 | 79.2 |
| Clerical | 20 | 23 | 126.8 | 71.9 |
| Children Under 20 | 12 | 6 | — | — |
| Housewives | 0 | 321 | 12.5 | 178.0 |
| Invalids | 0 | 1 | — | — |
| Unknown | 3 | 0 | — | — |

in industry means that greater numbers of persons are being exposed and may develop cancer unless adequate precautions are taken to prevent excessive exposure.⁶

Information obtained from death certificates for Minneapolis residents who died in the city from cancer during 1953 showed some significant differences in the cancer death rate for the various occupational groups (Table V).

Among men in Minneapolis, the mortality rate ranged from 405.5 per 100,000 in the laboring class to a rate of 115.5 for the semi-skilled group and 12.5 for unemployed males under twenty years of age. The highest rate for women was among those in the skilled trades—373 per 100,000 women employed in these trades—while the lowest rate was 71.9 for the clerical group. The death rate of 178 for housewives not in the labor force was slightly greater than the average rate of 154.9 for all women.

Respiratory cancer was found more frequently among persons employed in the skilled or semi-skilled trades or as laborers, while fewer housewives died of this type of cancer than would be expected. Cancer of the breast and genital organs was found more frequently among housewives than among the women of other occupational groups in this study.

Summary

The cancer mortality rates in the United States tend to be higher both in urban areas with more than 100,000 population than in smaller communities or rural areas and higher in the northern than the southern states. Consequently, it is to be expected that the cancer death rate in Minneapolis will be greater than those in the United States as a whole or the remainder of Minnesota.

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This study of cancer mortality in Minneapolis showed that:

1. During the period from 1941-1943 to 1951-1953, the increase in the cancer mortality rate here, is apparently due largely to the increase in the number of aged in the population and in a very small part to the change in classification of the cause of death.

When the correction is made for the increase in population of children and persons over sixty years of age, the total cancer death rate decreased 10 per cent from 198 deaths per 100,000 population in 1941-1943 to 178 per 100,000 in 1951-1953.

If the population correction is not made, the total cancer death rate increased slightly from 198 to 206.

2. The death rates during the past ten years for both men and women decreased for those fifty years of age and over. The only significant drop, however, is among men aged sixty to sixty-nine years.

3. The death rates (age-adjusted) for cancers of the buccal cavity, digestive system, genital organs and urinary organs are from 19 to 27 per cent below those for these sites ten years ago. Little change is evident in the death rate from cancer of the breast, while rates for cancer of the respiratory system, other sites and lymphoblastomas and leukemias have increased 23, 12 and 43 per cent, respectively.

4. More than one-third of all deaths for women forty to fifty-nine years of age are caused by cancer.

5. Cancer of the digestive system—principally the stomach and large intestine—is still the major problem, with a death rate more than 2.5 times that for any other site. Following in order of magnitude are cancers of the genital organs, breast, respiratory system, leukemia and the urinary organs.

6. Markedly higher death rates were found among certain occupational groups for 1953. For

men the occupational groups with the highest cancer death rates in Minneapolis during 1953 were laborers, with the semi-skilled having the lowest rate. Among women, those in skilled trades had the highest rate, while the clerical group had the lowest rate.

Every physician's office should be a cancer detection center. Since the survival of the patient depends largely on the stage of the disease at the time of diagnosis, early detection and treatment together with continuous education of the public regarding cancer are essential if real progress is to be made in cancer control. From the United States Public Health Service studies it has been found that, excluding cancer of the skin, 48 per cent of all cancer in females and 23 per cent in males is located in accessible sites in which early detection could be possible.

Occupational cancers are a group for which the cause is or could be definitely known and for which control is possible through modification in use of carcinogenic substances or protection of the worker from them. The increasing use of known or possible carcinogenic substances in industry makes this a potential problem. Consequently, it is important for physicians attending cancer patients to obtain information regarding possible exposure to carcinogenic agents.

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The follow-up is of more importance to the cancer patient than any other service following treatment.

* * *

The most common sites of neoplasms in childhood are: Intracranial tumors; cutaneous and soft somatic tumors; bone tumors; eye and orbital tumors; lymphoid and hematopoietic tumors; retroperitoneal tumors.

The granulosa cell tumor is the most common functioning ovarian tumor; the majority of reported cases have been in women who have passed the menopause.

* * *

The occurrence of postmenopausal bleeding associated with an ovarian tumor is very suggestive of a granulosa cell tumor.

Physical Therapy for Painful Shoulder

DONALD J. ERICKSON, M.D.
Rochester, Minnesota

PAINFUL shoulder," a general term applied to a substantial group of closely related conditions, may severely cripple a shoulder and cause considerable disability. "Periarthritis" is another term frequently applied to shoulder conditions characterized by pain and limited motion.¹ Pain and disability are often severe and may last for days, weeks or months.

The purpose of this discussion is to describe the proper use of various forms of heat, massage and exercise in the treatment of painful shoulder. Ghormley,² Coventry,¹ Smith³ and others have stressed the need for physical therapy in this condition. The tendency toward spontaneous recovery should not detract from the necessity of adequate and prompt treatment. To be truly effective these agents must be administered in the proper manner, under direct medical supervision. In addition, home physical therapy is mandatory since progress is slow and few patients can afford the prolonged professional treatment that is required, or such treatment may not be available to them.

In order to make clear the purpose of the treatment it is necessary to review some of the prevalent ideas which serve to explain the development of painful shoulder. Present concepts emphasize lesions of the so-called musculotendinous or rotator cuff of the shoulder. Calcareous deposits or partial or complete tears of the cuff may all be the result of degeneration, as first elucidated by Codman.⁴ De Palma⁵ has described changes in all soft-tissue components of the shoulder joint. Smith³ and Rose⁶ have pointed out that the pain which is produced by the changes in the supraspinatus tendon causes spasm of the muscles and immobilization of the shoulder. While this situation is favorable to healing and

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repair, if it persists over a long period it leads to muscular atrophy, adhesions and osteoporosis. The frozen shoulder represents culmination of this vicious cycle. If the spasm and pain do not persist long enough to produce the unfavorable factors, the cycle is reversed and spontaneous recovery may occur.

Coventry¹ has described personality factors which may have an adverse effect in some patients and prevent spontaneous recovery or retard improvement. He has stated further that these patients are hyperemotional and show hyperactive vasomotor responses. They expect someone else to get them well. The periarthritic personality is, according to Rome,⁷ a result of "poised indecisive ness," an inability to express tension.

Although lesions of the rotator cuff may be a common cause of painful shoulder, other conditions must be considered. Inflammatory conditions such as rheumatoid arthritis or tenosynovitis of the long head of the biceps or traumatic lesions from direct injuries or chronic irritation related to certain occupations, such as heavy labor, may initiate painful shoulder. Ghormley² has stated that painful shoulder may result from any condition requiring prolonged fixation of the shoulder joint. Coventry¹ has pointed out that the initial cause of shoulder pain leading to painful shoulder may be irritation of a cervical nerve root either by cervical osteoarthritis or by a protruded cervical disk. Periarthritis of the shoulder may appear with coronary heart disease although the relationship is not clear, as reported by Scheifley.⁸

Heat and Massage

For the relief of pain the various types of heat and massage can be used. An effective heating device is a simple clamp lamp, as described by Krusen,⁹ which may be used in the home very conveniently on a prescription basis. Shortwave or microwave diathermy is especially helpful in the treatment of painful shoulder. The former

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is applied either by the use of a cable electrode coiled around the shoulder and insulated from the skin by toweling or by means of a drum electrode. No information is available to indicate which technique is superior. However, in the department with which I am associated, the cable wrap is used most commonly, mainly because it can be applied so that the whole shoulder girdle is heated more evenly, whereas, with the drum electrode, more of the heat is concentrated over the tip of the shoulder.

Microwave diathermy may be applied to the shoulder with any of the three smaller directors directed over the tip of the shoulder joint.¹⁰ The duration of the heat should be for thirty minutes. Occasionally, diathermy aggravates the pain in this condition. However, if the intensity of the heat is kept at a low level, the patient may derive considerable benefit without aggravation of his discomfort. Recent unpublished data indicate that pulsed ultrasonic energy applied to the shoulder by the stroking technique is nearly as effective as microwave diathermy when massage and exercise are used.¹¹ Occasionally, it may be necessary to substitute some other form of heat for diathermy if the patient is unable to tolerate the deep heat. This is particularly true in the early stage of the disease. Instead of diathermy one may use radiant heat or hotpacks. There seems to be general agreement that x-ray therapy frequently is effective in relieving pain in the acute phase of painful shoulder.

The use of sedative massage augments the effects of heat. Moderately firm stroking and kneading movements are used to promote relaxation of the muscles and to relieve pain. The patient is enabled to move his shoulder more easily. Massage may cause pain in the acute phase, if tenderness is marked. Otherwise, it is useful in all phases of painful shoulder. A member of the family can be trained to administer massage in this condition. However, it is our belief that whenever heat is used it is well to follow it with sedative massage.

Restoration of Motion

Restoration of motion by exercises is the most important aspect of treatment in this condition. In the acute phase, motion may be limited to a few degrees by spasm and pain. If the pain can be relieved either by the use of heat and massage or by x-ray therapy or by some orthopedic pro-

cedure, such as needling or injection of compound F (hydrocortisone), motion may be restored rather rapidly, perhaps in one or two weeks, merely by active exercises. If the pain is severe in the acute phase, it may be necessary to put the shoulder at rest by the use of either a sling or an abduction splint. The need for rest in this condition has been stressed by Rose.⁶ He reasoned that because of the spasm there is adoption of the position of adduction and internal rotation of the arm, and the contracture of the shoulder cuff and the shoulder in this position leads to the development of frozen shoulder, a condition which is usually extremely resistant to treatment. As a general rule, the more intense the pain, the greater the need for rest of the part. Indeed, rest in bed may be necessary for some patients with the arm maintained in the position of slight abduction and midway between internal and external rotation. The arm must be removed from the splint or the sling several times a day for general, passive, relaxed, reciprocal range-of-motion exercises of the shoulder joint. As the pain subsides, the exercise program can be increased in order to hasten recovery.

According to Watson-Jones,¹² limitation of motion by muscle guarding rapidly progresses to limitation by adhesion formation and in severe cases by generalized adhesions of the whole paracapsular tissue, leading to a frozen shoulder. Neviser¹³ has expressed the belief that there are adhesions of the folds of the inferior aspect of the relaxed capsule in addition to the adhesions of various other surfaces about the head of the humerus. Moseley¹⁴ has expressed the same opinion and has added that probably other adhesions are present in the region of the superior aspect of the head, perhaps underneath the insertion of the rotator cuff. According to Jampol,¹⁵ Sir Colin MacKenzie was of the opinion that a stiff shoulder did not necessarily mean that adhesions in the joint were binding the head of the humerus to the glenoid cavity. He maintained that the two factors concerned are adduction contracture which is especially favored by gravity and the weakness of the muscles which elevate the limb.

It is very important to have the confidence of the patient in regard to exercises. Otherwise, the treatment will be ineffectual. The initial exercises which are used are the so-called pendulum exercises. The body is bent forward and the affected

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limb hangs like a pendulum. Motion of the limb is encouraged so that it will swing in circles. Progression of these exercises can be accomplished by increasing the size of the circle which the hand describes, as well as increasing the number of repetitions. No muscular action of a shoulder girdle is required and the muscles are relaxed. A 3- or 4-pound weight may be placed in the hand to increase the effectiveness of this exercise. As Jampol¹⁵ has correctly pointed out, the shoulder capsule must be stretched in order to mobilize the head of the humerus which is held high in the glenoid fossa either by adhesions of the shoulder capsule or by spasm of the muscles.

The next step is to proceed with exercises designed to increase the range of rotation, particularly external rotation which is usually very limited because the arm is held in a position of internal rotation and adduction. The patient is instructed to rotate the arms externally with the elbows held close to the body. When this is done actively the internal rotators of the shoulder are stretched and the external rotators are strengthened. When there is considerable tightness it will be necessary for the physical therapist to assist in this motion, thus performing active assistive exercises. There are many variations of this type of movement. For example, the patient holds his hands clasped behind his head and his elbows forward. He then pulls his elbows backward. When this motion is extremely painful, it should be done against resistance, given manually by the physical therapist. This makes use of the reciprocal innervation principle and the patient often finds that the exercise is less painful.

The next group of exercises is designed to increase the range of internal rotation. It is important that the patient be able to place his hand behind his trunk and this requires considerable range of internal rotation. The hand is placed behind the back, the forearm is supinated and the patient attempts to raise his hand as high as possible toward his scapulae. He may assist this motion with the other hand or he may use an assistive device such as an overhead pulley or stick or wand held in both hands.

Increasing the mobility of the shoulder girdle is the next step because the whole shoulder complex is limited in motion. These exercises of necessity include exercises for abduction and adduction. The patient brings the arm up forward

and attempts to get it up over the level of his head. The same exercise is done bringing the arm up laterally with the hand supinated as much as possible in order to rotate the humerus to permit full abduction. It may be necessary for the therapist to provide considerable assistance in both of these motions; in addition, the therapist will prevent elevation of the scapula. The use of a shoulder wheel, overhead pulley and finger ladder is of great help in these movements. It is possible for the patient to provide an overhead pulley and finger ladder in his home. The treatment must be continued until the patient has recovered full range of motion.

Summary

Physical therapy under medical supervision is useful in all phases of painful shoulder. In the acute painful phase, the various types of heat including diathermy are used to relieve pain and spasm. If the pain is severe, the use of a sling or splint is indicated for a short period. As the pain subsides a progressive program of exercise is added in order to preserve or increase the range of motion of the shoulder joint. Some of the exercises described can be performed unaided by the patient while some require help by a physical therapist or some member of the patient's family. When the condition is more severe than usual and a more strenuous exercise program is needed, assistive devices for exercise are required.

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Can We Further Decrease Infant Mortality?

JACK R. PIERCE, M.D.
Virginia, Minnesota

A FEW months ago a survey of infant deaths at the Virginia Municipal Hospital was started. During this time, a study of neonatal and stillbirth rates in the State of Minnesota for 1952¹ showed that we ranked third best in neonatal deaths and seventh best in stillbirths among twenty-six hospitals of similar size in Minnesota. This rating seemed rather good. In going over our deaths it became obvious that our rating could be improved. The purpose of this paper is to show that although our fetal mortality rates may be acceptable, or even good, we should not complacently ride along because we are doing so well. As you will see, there is ample room for improvement.

This study extends from April 1, 1951, to April 1, 1954. There were a total of 2,393 live births. The total death rate was 31 per thousand. The still birth rate was 14.6 per thousand. The neonatal death rate was 16.2 per thousand. There were 165 prematures with 51 deaths among the prematures. In other words, prematures which made up 6.8 per cent of the total deliveries, had 69 per cent of the deaths. Death rate among prematures was 31 per cent.

Only infants beyond twenty weeks' gestation were considered in this study. The autopsy rate was 43 per cent.

I have broken down the figures according to the relative time of death. I have not listed prematurity among the diagnoses. I feel that prematurity is only a sequelae of some other pathological condition.

If you will refer to Tables I through IV you will note that the deaths which occurred at a time most remote from the time of delivery were the deaths to which we were least able to contribute a cause; that is the macerated stillbirths. As we approach the time of delivery in the recent and intrauterine deaths, the intrapartum deaths and especially the neonatal deaths, we note that

controllable obstetric factors become more and more prominent as the causative or contributing factor in the death of the infant.

By glancing at Table V which is a listing of the total number of each complication among the entire group of infant deaths, you will note that a great majority of deaths were associated with a few complications. These were, in order of decreasing frequency: premature separation of the placenta, multiple pregnancy, toxemia of pregnancy and congenital anomalies. You will note also that there were seven cases in which no particular cause of death was listed. Several of these cases had charts which were so incomplete as to make it impossible to deduce any diagnosis.

Next, the cases were picked out in which I thought there were errors of commission or omission in the treatment. I do not maintain that each of these errors caused the death of the baby in each instance. I do maintain, however, that the errors were not in the best interests of the patient. Table VI is a listing of these errors. When reading over this list, keep in mind that these things occurred in a hospital which has quite a low infant death rate compared to other similar hospitals in the state.

Next, I have grouped cases according to obstetrical diagnoses. I will mention only the cases which, in my opinion, might have been prevented or in which something grossly wrong was done or in which something important was omitted in the treatment. The first of these comes under the heading of indiscriminate use of oxytocic drugs. There were seven of these cases. In four, oxytocics were used without medical or obstetrical indication, apparently for the sake of convenience:

1. Probably not preventable. Birth weight 1 pound 2 ounces. Intramuscular pitocin near the end of first stage.
2. Term. Castor oil and quinine. Hard, driving, short labor. Prolapsed arm. Autopsy, bloody subarachnoid fluid, adrenal hemorrhage.
3. Powdered ergot induction. Birth weight 4½ pounds. Persistent posterior. Autopsy, hemorrhage in the meninges, 7½ gr. nembutal three hours before delivery.

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INFANT MORTALITY—PIERCE

TABLE I. DIAGNOSES ASSOCIATED WITH STILLBORN MACERATED FETUSES

| | |
|---|----|
| Stillborn macerated fetuses | 12 |
| Prematures | 7 |
| 3 One of a set of twins. Small fibrotic placenta. | |
| 3 No particular cause of death. Small fibrotic placenta. Many white infarcts. | |
| 3 Congenital. | |
| 1 Rh sensitization—37 weeks. | |
| 1 Ulcerative colitis—7½ months. | |
| 1 Acute toxemia near term. | |

TABLE II. DIAGNOSES ASSOCIATED WITH RECENT INTRAUTERINE DEATHS

| | |
|---|----|
| Recent Intrauterine Deaths | 11 |
| Prematures | 7 |
| 3 Premature separation of placenta. | |
| 2 Chronic nephritis? Twins. | |
| 2 Acute toxemia. | |
| 1 Neuritis? | |
| 1 Chart useless. No diagnosis possible. | |
| 1 Rupture of section scar. | |
| 1 Premature separation of placenta—fatal auto accident. | |

TABLE III. DIAGNOSES ASSOCIATED WITH INTRAPARTUM DEATHS

| | |
|--|----|
| Intrapartum deaths | 12 |
| Prematures | 8 |
| 4 Premature separation. | |
| 3 No particular cause—(1 driving labor; 1 pitocin, 1 pound 2 ounces). | |
| 2 Breech. | |
| 1 Face presentation (pitocin). | |
| 1 Premature rupture of membranes with prolapsed cord. | |
| 1 Pitocin induction—F.H.T. stopped during induction. ? Rh sensitivity. | |

4. Second of twins which were undiagnosed. Intramuscular pitocin at 6 cm. along with 7 cc. delvinal.

The next three cases show the improper use of oxytocics. These include:

1. Pitocin induction. Possible Rh sensitivity. Membranes not ruptured. Separation of placenta followed induction.

2. Pitocin without rupturing the membrane. Premature separation.

3. Face presentation, chin anterior. Position not known. Pitocin because of lack of progress of presenting part.

In three of the cases where there was no medical indication for their use, oxytocic drugs must be held responsible for the death of the baby since they were of viable size and there was no other serious complication. In two of the cases where there were other complications it is quite probable that the oxytocic drugs used improperly were responsible for the death of the baby. If we discard the eight deaths in infants who showed congenital anomalies incompatible with life, these five cases in which oxytocic drugs were used indiscriminately would account for 7.5 per cent of the infant deaths during this three-year period.

TABLE IV. DIAGNOSES ASSOCIATED WITH NEONATAL DEATHS

| | |
|---|----|
| Neonatal Deaths | 39 |
| Prematures | 29 |
| 9 Premature labor with twins (1 pitocin for convenience). (1 congenital anomaly). | |
| 7 Premature separation (1 diabetic). | |
| 5 Placenta previa. | |
| 4 Congenital anomalies. | |
| 4 Toxemia (1 diabetic). | |
| 2 Rh sensitization (1 death due to regurgitation and aspiration). | |
| 2 Induction of labor for convenience. | |
| 2 Premature labor—no cause. | |
| 1 Breech. | |
| 1 Persistent posterior (attempted unsuccessful version). | |
| 1 Lobar pneumonia. | |
| 1 Apparently normal pregnancy and delivery. Probable aspiration in nursery. | |

TABLE V. TOTALS OF DIAGNOSES ASSOCIATED WITH DEATHS IN THE ENTIRE SERIES

| | |
|--|--|
| 15 Premature separation. | |
| 11 Multiple pregnancy. | |
| 9 Toxemia (One of these was multiple pregnancy). | |
| 8 Congenital anomalies. | |
| 7 No particular cause—several useless charts—1 pitocin. | |
| 5 Placenta previa. | |
| 4 Rh—2 of these probably not due to Rh (1 pitocin and 1 aspiration). | |
| 3 Breech. | |
| 3 Acute infection (pneumonia, colitis and neuritis?). | |
| 2 Induction of labor. | |
| 2 Premature labor—cause undetermined. | |
| 1 Version extraction on posterior. | |
| 1 Face—chin anterior. | |
| 1 Rupture of section scar. | |
| 1 Prolapsed cord. | |
| 1 Regurgitation and aspiration. Normal OB. | |

TABLE VI. ERRORS

| | |
|---|--|
| Obstetric | |
| 74 No record of anesthesia. | |
| 45 No serology. | |
| 38 No Rh typing (mother). | |
| 33 Consultation not obtained in bleeders, toxemias, malpositions, compound presentations. | |
| 8 Toxemias with delayed and inadequate treatment. | |
| 7 Charts very incomplete. | |
| 6 Large amounts of respiratory depressants too close to delivery. | |
| 4 Oxytocic drugs without indication. | |
| 3 Oxytocic drugs with improper indication or without precautions. | |
| 1 Prolapsed cord. Closer attention to F.H.T. | |
| 1 Spinal anesthesia to mother in shock for delivery. | |
| Pediatric | |
| 39 No history or physical on any live birth chart. | |
| 18 No consultation. | |
| 10 Cyanosis, labored respirations and in oxygen—babies fed and watered. | |
| 8 Over 2½ pounds. Tracheal tug. No attempt to clear airway. | |
| 1 Alpha lobelin to an apneic baby—no airway or oxygen. | |
| 1 CO ₂ only to an apneic baby—no other respiratory stimulant. | |
| 1 Cyanotic premature—bath in water. | |
| 1 Regurgitation—aspiration—Nothing done until doctor arrived. | |

This is too high a price to pay for someone's convenience. It is time for those who have the patients' welfare at heart to take a stand against those who glibly advocate labor and delivery at a time of their own choosing through the use of oxytocic drugs.

The next group is that of the toxemias. These number seven. Some of my comments written while going over these charts have been noted:

1. Twin pregnancy. The only thing noted on the entire chart was a mention of albuminuria during this pregnancy. No physical examination. No blood pressure during the prenatal course. No blood pressure on the patient's chart.

INFANT MORTALITY—PIERCE

2. Acute toxemia. Inadequate therapy. No abnormalities noted in the prenatal care. No record of attempt to control fluid balance.
3. Patient responsibility.
4. Treatment inadequate. Eclampsia developed. Toxemia subsided, but labor was not induced.
5. Multiple pregnancy. Moderately severe pre-eclampsia. Toxemia of several weeks' duration. Procrastination.
6. No record of prenatal blood pressure. Procrastination.

The chief errors in these cases seem to be in failure to institute adequate medical therapy soon enough and failure to induce labor once the toxemia is stabilized.

The next group, that of premature separation, numbered six. Again some of my comments on the cases are recorded:

1. Labor was induced with intramuscular pitocin. Membranes were not ruptured, and no pelvic examination.
2. Patient responsibility.
3. Patient bled for six hours in the hospital without any attempt at diagnosis or treatment.
4. Intramuscular pitocin without rupture of the membranes.
5. No pelvic examination. Membranes were not ruptured, and intramuscular pitocin was given.
6. Septate uterus. Placenta was found in one horn and infant in the other. Membranes were not ruptured. Vaginal delivery was done.

Along with these there were two cases of placenta previa in which the treatment was questionable. One was a seven months' pregnancy. With due precaution this pregnancy might have been prolonged in the hospital to a period of viability. In the other case, the patient bled nine hours in the hospital without treatment, finally went into labor and delivered spontaneously.

In these bleeders, then, we have the use of oxytocics without rupturing the membranes and lack of any treatment whatsoever. Cesarean section was not considered in at least one case where it should have been, that of the septate uterus.

The next group is that of malposition. These number four:

1. An occiput posterior, weight 7 pounds 12 ounces, in a primigravida. No pelvimetry or pelvic measurements were recorded on the chart. Attempted version extraction, jack-knifed the baby, got stuck, then called for help. Postpartum pelvimetry revealed a slightly contracted pelvis.
2. A frank breech in a para 3, gravida 4. Weight 8 pounds 1 1/4 ounces. The second stage lasted two hours.

Fetal heart tones were heard until just before delivery. Infant was stillborn. Tentorial tear and bilateral adrenal hemorrhages were found.

3. A prolapsed arm in which labor was induced for convenience in a primagravida. Forceps delivery with no episiotomy was done. Baby was live born, breathing very poorly, and was not given suction. No oxygen was used. Autopsy, bloody subarachnoid fluid and one large adrenal hemorrhage were found.

4. Frank breech, weight 4 pounds 9 1/4 ounces. Premature rupture of the membranes occurred. Death was apparently due to inexperience—did not recognize the position, did not call for consultation until the body had delivered, unable to deliver the head.

There should be practically no deaths from mal-position if recognized and properly treated.

Under Rh sensitivity there were two cases which should not have been lost:

1. Induction by rupture of membranes. Infant delivered at thirty-six weeks. The infant was doing well so far as the Rh was concerned, but regurgitated and aspirated. The nursery personnel left the infant to summon the doctor by telephone without applying suction.

2. Rh negativity of the mother was not noted during pregnancy. Typing was apparently wrong. This was not discovered until the baby developed jaundice on the second day of life. Infant was not transfused. Baby lived four days.

Under miscellaneous:

1. A premature rupture of the membranes and a prolapsed cord were not noted until delivery. Fetal heart tones were heard one-half hour before delivery. Closer observation of the fetal heart tones would have alerted one to this possibility.

2. Spontaneous rupture of an old section scar was the diagnosis which was missed for a period of six to eight hours before laparotomy. Patient went into shock. Spinal anesthesia was used.

We then find four groups of cases in which most of the errors of commission or omission occur:

1. In the *toxemias* the chief difficulty seems to be inadequate treatment and procrastination.
2. In the *bleeders* we have lack of adequate treatment and the use of oxytocics without the rupture of the membranes.
3. In the *malpositions* it appears to be a matter of inexperience, inability to make a proper diagnosis, or complete lack of judgment.

4. In the *indiscriminate use of oxytocics* the chief difficulty seems to be the indiscriminate use of oxytocics.

It is quite obvious that our infant salvage could

INFANT MORTALITY—PIERCE

have been improved. In a few concise statements, how could we have improved it?

(1) By being constantly on the alert for toxemias; treating them adequately, and inducing labor when the toxemia is stabilized. (2) By treating bleeders after making a diagnosis. If induction of labor is selected, the membranes should be first be ruptured. (3) One should always make a diagnosis of the position during labor by whatever means necessary. One should not attempt operative maneuvers beyond his capability. (4) The oxytocic drugs should not be used for the convenience of the patient or the physician. If there is an indication for their use, the recognized prerequisites and precautions should be taken. (5) Newborn infants who are cyanotic or having difficult respirations should receive nothing by mouth and should not be bathed. Stimulants should not be given to a newborn infant unless a clear air-way is assured and an adequate supply of oxygen is being given. Carbon dioxide in an apneic infant is not a respiratory stimulant. Nursery personnel should be instructed in, and told to use the emergency procedures in case of regurgitation and possible aspiration.

These sound like dry old text-book statements, which they are. However, had the physicians responsible in these cases been familiar with, and used, these dry old statements, there would have been quite a few more live children today.

I am sure that similar, and even worse, situations exist throughout the country. If such conditions exist in a hospital which has a quite low infant mortality rate, one can imagine the state of chaos that must prevail in the institutions with a high mortality rate.

Some of the findings of this study have been presented to our medical staff. Many improvements in the charts have already been made.

The amount, type, and duration of anesthesia are now fully recorded. Immediate postpartum examinations and discharge examinations on the infants are now being fully recorded. A labor history is included in the infants nursery record including the amount of sedation, anesthesia, pathological conditions in labor and immediate condition of the infant at birth. A pediatrician has been placed in charge of the nursery. Most important, we are starting a permanent fetal mortality study. The group studying this includes a pediatrician and a pathologist. We feel that all

infants, whether stillborn or live born, should be included in this study. We feel that there should be a high degree of uniformity in these studies throughout the state and for this reason we are using a form which requires essentially the same information as the Hennepin County Fetal Mortality Study Committee. We definitely feel that these studies should be carried on at local level.

Addendum

It is of interest to note in relation to the indiscriminate use of oxytocic drugs that on this same program, in a round-table discussion, it was brought out by Dr. J. L. McKelvey that in an entirely independent study, the indiscriminate use of oxytocic drugs was the third most common cause of maternal mortality in Minnesota. The percentage of maternal deaths (approximately 7 per cent) attributed to the oxytocic drugs was essentially the same as stated by this author (7.5 per cent) in relation to infant mortality attributed to oxytocic drugs.

Reference

1. Minnesota Department of Health, Section of Maternal and Child Health and Section of Vital Statistics: Infant and Neonatal Mortality and Stillbirth Rates by Hospitals, 1952. p. 3.

Discussion

E. C. MAEDER, M.D., Minneapolis: I wish to congratulate Dr. Pierce on his fine presentation of this timely subject, also on his interest in the formation of an Infant Mortality Study Committee in Virginia. The Hennepin County Neonatal Mortality Study is now completing its third year, during which period about 1,000 cases have been reviewed.

There is no question but that neonatal or infant mortality can be reduced by more intensive effort on the part of all physicians. Such studies should be carried out by each hospital's own staff. A team consisting of a pediatrician, obstetrician and pathologist should be appointed to appraise all neonatal deaths. The Hennepin County group has now added an anesthesiologist to its committee, as the importance of maternal anesthesia and analgesia as contributing to neonatal depression and anoxia is well recognized.

Every single fetal death should be analyzed, no matter how immature or obvious the cause. Gross fetal anomalies inconsistent with life are still being overlooked.

Dr. Pierce has stressed the importance of good complete records. They are a must for any good survey. Particular effort must be made to find the mothers who have a history of premature births, repeated abortions and miscarriages.

In the 1952 Hennepin County report of 320 mothers and 333 offsprings, obstetrical complications were associated with 114 infants or 34 per cent. With bleeding late in pregnancy, often an expectant management, with sensible precautions, does not compromise the mother's safety. Prolonging gestation to the relative safe thirty-six weeks and beyond is the greatest possible step in the

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Fractures of the Pelvis

A Report of Eighty Cases Treated at University Hospitals

LEONARD F. PELTIER, M.D., Ph.D.
Minneapolis, Minnesota

THE pelvic ring contains within its confines the pelvic viscera and forms the floor of the abdominal cavity. This ring is a semi-rigid structure formed of three large bones bound together with strong ligaments. To fracture or to separate the components of this ring requires considerable force. This force may be exerted in the body generally, producing injuries unrelated to the pelvic fracture, or it may be concentrated locally, producing injury to the pelvis and the abdominal viscera. Two-thirds of the patients in the group reported here had other injuries occurring in association with an injury of the bony pelvis. It is self-evident that the responsibility of the physician in ministering to these patients does not end with the establishment of a diagnosis of a fractured pelvis, but must include a thorough search for other, commonly more serious, injuries.

This report is based upon experience gained in the treatment of eighty patients (fifty-one male, twenty-nine female) who were treated at the University Hospitals in the years 1947 through 1954. The ages of the patients ranged from three to ninety-three years and were evenly distributed over the life span. One-third of them (twenty-six) had isolated fractures of the pelvic ring. Two-thirds of them (fifty-four), however, had multiple injuries in addition to fractures of the pelvis. Sixteen of these patients had visceral injuries. The remainder of the injuries varied in severity and were disseminated throughout the body (Fig. 1).

The manner in which the injury was incurred will frequently suggest the coincidence of visceral and other injuries. Was the patient crushed between two objects? Did a wheel pass over the trunk? Did he fall from a height? Was he struck, tumbled or rolled? Corroborative physical signs such as tire marks on the skin, the loca-

tion of abrasions and confusions, the presence of fractured ribs, will all aid in reconstructing the course of the forces producing the injury. The initial physical examination must be thorough,

FRACTURES

| | |
|--------------------------|----|
| Skull ----- | 2 |
| Facial Bones ----- | 2 |
| Cervical ----- | 5 |
| Scapula ----- | 1 |
| Ribs ----- | 5 |
| Humerus ----- | 5 |
| Metacarpal ----- | 1 |
| Ribs ----- | 15 |
| Transverse Process ----- | 2 |
| Hip ----- | 2 |
| Femur ----- | 4 |
| Tibia ----- | 6 |
| Ankle ----- | 5 |
| Colostomy ----- | 1 |
| Hip ----- | 11 |
| Shoulder ----- | 2 |
| Wrist ----- | 2 |

DISLOCATION

| | |
|----------------|----|
| Hip ----- | 11 |
| Shoulder ----- | 2 |

OTHER INJURIES

| |
|--|
| 8 - Concussion |
| 1 - Whiplash Injury |
| 2 - Pneumothorax |
| 1 - Subcutaneous Emphysema |
| 3 - Ruptured Diaphragm |
| 2 - Ruptured Spleen |
| 1 - Ruptured Ileum |
| 1 - Ruptured Colon |
| 8 - Ruptured Bladder |
| 1 - Perirethral Extravasation |
| 10 - Hematoma |
| 1 - Torn Medial Meniscus |
| 1 - Damage to External Iliac Artery with Gangrene of Leg |
| 5 - Soft Tissue Injuries |



Fig. 1. Injuries associated with fractures of the pelvis (80 cases).

with special attention to the chest and abdomen, since these findings form a base line against which all changes in the patient's findings during the succeeding hours can be evaluated.

The initial blood loss in a patient with a fracture of the rami of the pelvis may be considerable. This can be easily demonstrated on the cystogram by the displacement of the bladder away from the site of fracture by the hematoma. Shock occurring shortly after injury is usually associated with local blood loss and can be effectively treated by transfusion. Shock occurring after twelve to twenty-four hours in a previously stabilized patient is of grave import and should signal immediate exploratory laparotomy. In our cases late shock has always been associated with a ruptured abdominal viscous.

There were eight deaths occurring after fractures of the pelvis, a mortality of 10 per cent. One of these, occurred in a hospital patient with renal failure associated with congenital polycystic kidneys. One week prior to death, the patient

From the Department of Surgery, Division of Orthopedic Surgery, University of Minnesota.

FRACTURE OF THE PELVIS—PELTIER

fell and sustained an undisplaced fracture of the pubic rami on one side. Another patient died of cardiac arrest during anesthesia administered for the performance of a supra pubic cystostomy in

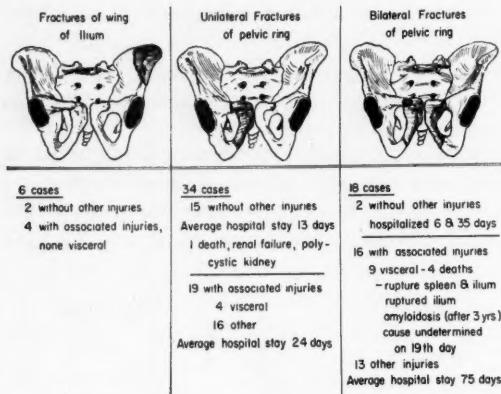


Fig. 2.

the treatment of a ruptured bladder. Four patients died as a result of complications arising from injuries to abdominal organs. One patient died of undetermined causes after leaving the hospital. One patient died of amyloidosis three years after injury as a result of chronic pelvic suppuration arising initially in an open fracture of the pubic rami and a ruptured bladder.

There were only three late complications directly attributable to the pelvic fractures. These were an ischio-rectal abscess, a urethral stricture, and a myloidosis. There were no complications of fracture healing. Bony union of the pelvic fractures of stabilization of the symphyses separations occurred in all cases.

The fractures of the pelvis in these patients have been divided into two groups: those requiring special treatment, and those requiring no treatment except supportive care.

Figure 2 outlines our experience with isolated fractures of the ilium, and fractures of the pubic rami, bilateral or unilateral. These cases make up about three-fourths of the total number of patients. The treatment of the fractures in this group consisted of good supportive care and the institution of activity as soon as the patient was able to move about. The patients were actively encouraged to turn, to sit up in bed, to be up in a chair and to walk with or without the support of crutches as soon as possible. The only

limitation on their activity was pain. As can be easily seen, the more extensive the injury, the longer the period of hospitalization required. However, a large portion of the morbidity can be attributed to the presence of other associated injuries. Plaster dressings were not used in any of these patients in the treatment of the pelvic fractures. No complications attributable to the regimen were encountered.

Figure 3 contains information regarding those cases requiring specific treatment for their fractures of the pelvis. Fractures with displacement of the hemipelvis, fractures of the acetabulum and symphyseal separation accounted for about one-fourth of our cases.

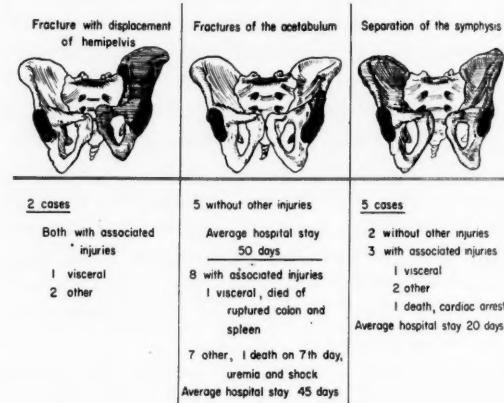


Fig. 3.

Fractures of the pelvis with displacement of the hemipelvis upward were treated by strong skeletal traction through the distal end of the femur. An attempt was made to pull the displaced portion into a normal relationship with the opposite side. Traction was maintained for three to six weeks until the position of the fragments were stabilized. The patients were then encouraged to resume normal activity as soon as possible.

Fractures of the acetabulum were associated with dislocation of the hip (twelve posterior, one central) in all cases. The primary treatment consisted of reducing the dislocation and maintaining the reduction by traction on the leg. When the reduction was unstable, operative fixation of the acetabular fragment was carried out. The end result in these cases depended not upon the

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Hyperpotassemia and Hyperglycemia

Treatment with Insulin and Invert Sugar

CARL O. RICE, M.D., Ph.D., and
J. H. STRICKLER, M.D., M.S.
Minneapolis, Minnesota

WHEN hyperpotassemia develops, it represents a critical complication.⁷ This condition is not observed as frequently as hypopotassemia, but when it does occur its correction must be made within a few hours lest sudden death from heart stoppage supervene.¹⁰ Cardiac arrest usually occurs in diastole in this condition.⁷

The presence of hyperpotassemia can be clinically suspected in the presence of oliguric uremia,¹⁴ unexpected cardiac irregularities and when the patient experiences undue weakness or flaccid paralysis.^{7,12} It can be definitely identified only by serum potassium determinations or by electrocardiographic findings.¹⁴

A number of methods^{2,6,8} for the control of hyperpotassemia have been suggested. We have observed the effect of treating this condition with large doses of intravenous invert sugar and large doses of insulin on the basis that when the metabolism of glucose is forced, the potassium ion is removed from the blood stream in the process of glycogenesis.^{5,8}

Case Report

J. R., aged sixty-six, 51 kg., entered the hospital January 15, 1954, with symptoms suggesting ruptured sigmoid diverticulitis. He appeared dehydrated and he was acidotic (CO_2 18.2 mEq./L). Because of the critical nature of his illness it was decided to treat him conservatively for the time being. His heart action was irregular. He was weak and listless. He was oliguric though not anuric. He was given 1,900 cc. of 5 per cent glucose, 5 per cent amino acids and 5 per cent alcohol daily for two days. During this two-day period the patient received a total of 108 mEq. sodium, 36 mEq. potassium and 164 mEq. chloride.

The results of blood chemical determinations made two days after admission are illustrated in the graphs (Figs. 1 and 2). It was evident that he was suffering from an electrolyte imbalance, the most critical aspect of which was the high serum potassium. His blood sugar likewise was elevated.

As soon as these findings were observed, he was given

This study has been supported in part by a grant from the Baxter Laboratory, courtesy Robert P. Herwick, M.D., Medical Director.

50 units of insulin subcutaneously and 250 units of insulin intravenously in 2,000 cc. of 20 per cent invert sugar during the next twelve hours. The amount of insulin and invert sugar administered on subsequent days is also illustrated in the graphs.

Blood chemistries were then determined every few hours (Fig. 1).

Seventy-eight mEq. of sodium in the form of sodium lactate was given on the 15th and 16th in an effort to aid in the correction of the acidosis. No other electrolytes were administered during this period of observation. Balance studies were conducted (Fig. 3).

Five days after he had recovered from the electrolyte imbalance, as illustrated in this study, he developed a strangulating, incarcerated incisional hernia which required emergency operation. The diagnosis of ruptured sigmoid diverticulitis associated with a diffuse fibrinous exudative peritonitis was confirmed. He made a satisfactory recovery from this operation without complications.

An analysis of the studies which were made during this critical period is of interest.

Blood Sugar

It can be observed that the blood sugar dropped rapidly during the period when insulin was given on the 15th. The patient was semi-comatose at the outset of this treatment when the blood sugar was 296 mg. per 100 ml. He was responsive when the blood sugar was 146 mg. and he was in insulin shock when the blood sugar was 57 mg.

The intravenous invert sugar and insulin were then discontinued for nine hours. The blood sugar rose spontaneously to 232 mg. on the morning of the 16th. Treatment was again instituted with smaller doses of insulin and 20 per cent invert sugar. Again the blood sugar promptly came down to a low level and treatment was discontinued when the blood sugar was found to be 61 mg.

During the second interval of twelve hours in which no insulin or sugar was given, the blood sugar again rose to 304 mg. Invert sugar and insulin were given again in smaller doses until

HYPERPOTASSEMIA AND HYPERGLYCEMIA—RICE AND STRICKLER

the patient was able to eat on the afternoon of the 19th.

This erratic reaction of the blood sugar appears to illustrate the disturbance in the carbohydrate metabolism associated with the alarm reaction

the liver^{3,4,5,8} though the potassium balance figures (Fig. 3) indicate that 411 mEq. of potassium were excreted in the urine during the three days in which the serum potassium dropped from 9.4 to 3.9 mEq.

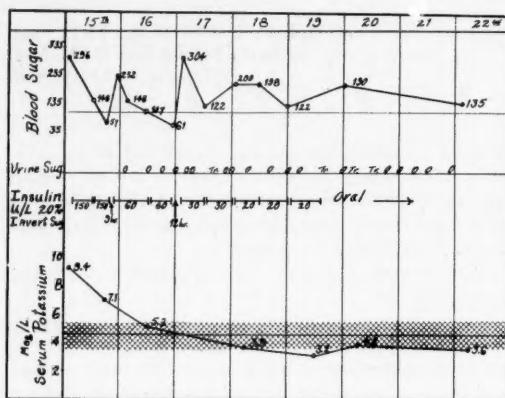


Fig. 1. Note simultaneous drop of blood sugar and serum potassium on 15th during administration of 300 units of insulin. Blood sugar rose spontaneously on two subsequent occasions (16th and 17th) when insulin and invert sugar were discontinued.

similar to that observed by Abbott and others. The bromsulphalein tests done on the 15th and 16th revealed 60 and 50 per cent retention, respectively. Glucose tolerance test done on the 27th (ten days after these studies) revealed a disturbance in the carbohydrate metabolism (blood sugar fasting 104, one-half hour 203, one hour 278, two hours 308, three hours 286).

Subsequent glucose tolerance tests done four months later suggest that the carbohydrate disturbance was not diabetic (Table I).

The blood phosphate was of no value in excluding a diagnosis of diabetes.¹¹

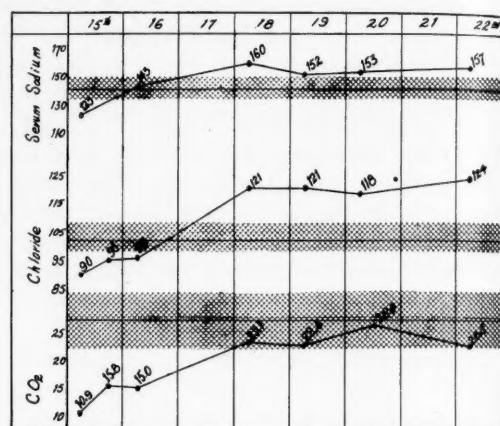


Fig. 2. Serum sodium, chloride and CO₂ combining power were all low at onset of treatment as illustrated in Figure 2. This graph illustrates the spontaneous correction of the electrolyte pattern of the blood which occurred during the forced metabolism of carbohydrate by the administration of insulin.

The Balance Studies

The intake, output and balance determinations clearly illustrate (Fig. 3) that the correction of the electrolyte pattern of the blood was not accounted for on the basis of the electrolyte intake.

There was only slight positive sodium balance on the 15th and 16th, insufficient to account for the subsequent rise in the serum sodium which occurred on the 18th and 19th even in the face of a negative sodium balance.

TABLE I

| 1954 Date | | Fasting | Gm. of Glucose | ½ Hr. | 1 Hr. | 2 Hr. | 3 Hr. | Urine Sugar |
|-----------|-----------|-----------|----------------|-------|-------|-------|-------|-------------|
| 1/27 | Bl. Sugar | 104 mgm. | 100 | 203 | 278 | 308 | 286 | Trace |
| 5/19 | Bl. Sugar | 95 mgm. | 100 | 160 | 195 | 125 | 105 | 0 |
| 5/26 | Bl. Sugar | 100 mgm. | 50 | 141 | 175 | 125 | 75 | 0 |
| 5/26 | Bl. Phos. | 4.08 mgm. | 50 | 4.24 | 3.95 | 4.16 | 4.16 | 0 |

The Serum Potassium

The graph illustrates the rapid drop in the serum potassium which occurred concomitantly with the administration of large doses of insulin and invert sugar. It is believed that this occurs during the process of carbohydrate metabolism as potassium is bound and presumably stored in

the blood chlorides as the blood chlorides rose.

These findings suggest a shift of the sodium and chloride from their intracellular position or from other stores in the body.¹

There was a considerable loss of potassium in the urine which, since there was an absence of

HYPERPOTASSEMIA AND HYPERGLYCEMIA—RICE AND STRICKLER

potassium intake, could have accounted for the rapid drop in the serum potassium level.

The patient was in positive caloric balance which averaged 125 per cent of his caloric require-

serum potassium was observed when 300 units of insulin was given in conjunction with 400 grams

The spontaneous recurrence of high blood sugar levels on two subsequent occasions, when the administration of sugar and insulin was temporarily interrupted, suggests a disturbance in the carbohydrate metabolism. This is also indicated by the glucose tolerance test done while in the hospital and the bromsulphalein retention. The subsequent finding of a normal glucose tolerance test indicates that the patient was not a diabetic.

The other electrolytes which were in imbalance appear to have been spontaneously corrected in the period during which carbohydrate metabolism was forced with insulin. This leads us to speculate that any severe electrolyte disturbance might be benefited by forcing, with the administration of insulin, the metabolism of large quantities of carbohydrate.*

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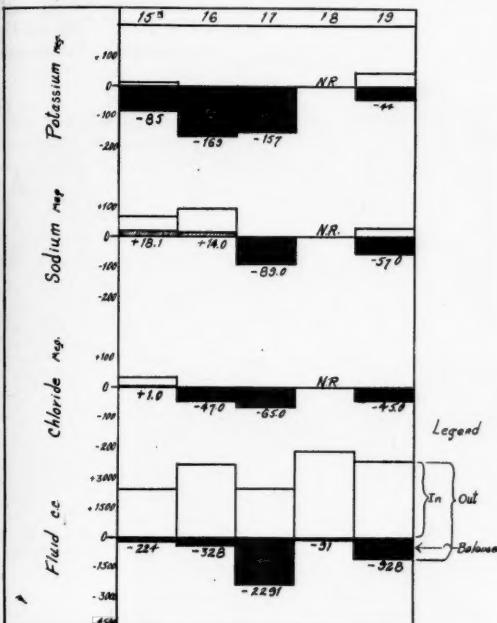


Fig. 3. Balance studies during the period of observation. There were no electrolyte intakes except for a small amount of sodium on the 15th and 16th. The potassium output could have accounted for the drop in the serum potassium as illustrated in Figure 2. Despite the negative sodium and chloride balances, and no intake, the serum sodium and chloride levels rose as illustrated in graph II. These observations seem to suggest a physiological shift of the electrolytes associated with the metabolism of invert sugar as induced by large doses of insulin.

ments. All of these calories were provided from invert sugar.

There was a negative nitrogen balance amounting to an average of -17.51 grams per day. This would be expected in that no nitrogen was administered during this period of observation.

Diuresis began on the 15th and continued through the 19th (Fig. 3). Clinical dehydration disappeared during this period of treatment despite the negative water balance. This was no doubt due to the shift of fluid.

Comments and Conclusions

This case illustrates the effectiveness of the treatment of hyperpotassemia associated with hyperglycemia by the administration of invert sugar and insulin wherein a rapid drop in the

Bilateral Glenoid Hypoplasia

ROBERT E. KASPER, M.D., and
JOSEPH JORGENS, M.D.
Minneapolis, Minnesota

FAILURE of development of the ossification center for the inferior rim of the glenoid is a rare anomaly. The patient described in this report presented this finding in association with bilateral flattening of the humeral heads, limitation of abduction, external rotation of the arms, and webbing of the axillae.

was webbing of the axillae when the humeri were abducted (Fig. 3). This webbing was most prominent in the posterior axillary folds. A skeletal survey revealed no other congenital variations. No history of birth trauma or bilateral injury to the shoulder joints was elicited. At the age of twenty-five the patient sustained a fracture of his right clavicle. Radiographs were obtained of the shoulders of one son, and two male grandchildren; all appeared normal.



Fig. 1, a and b. Antero-posterior projections of the right and left shoulders, showing the absence of the inferior rims of the glenoid, with secondary hypertrophic changes of the lower glenoids and heads of the humeri. Flattening of the humeral heads is also apparent.

Case Report

This patient was an eighty-seven-year-old retired Navy man, whose presenting complaint was intermittent leg pain. A diagnosis of arteriosclerosis and normocytic anemia, of undetermined cause, was made, and the patient responded in a satisfactory manner to medical therapy. On routine examination of the chest it was observed that there was underdevelopment of the glenoids bilaterally, manifested primarily by absence of the inferior glenoid rims. The humeral heads showed flattening; there were secondary degenerative arthritic changes involving the bones of the shoulder joint (Fig. 1, a and b). Axial views revealed normal alignment of the heads of the humeri in the glenoid fossa (Fig. 2).

Physical examination revealed a marked limitation of external rotation of the humerus. Abduction was limited to 90°. The most striking feature of the examination

The patient had been aware, all of his life, of a limitation of motion of his arms; this had not hindered his ability to work. The patient's son had never noticed the father's disability.

Anatomic Considerations

The ossification of the glenoid is from three centers. The floor is formed by the body of the scapula, which ossifies during the eighth week of intra-uterine life. The upper margin and the coracoid process are formed from a secondary center; this appears at about the tenth year. The inferior rim is derived from a center appearing in the thirteenth year. Normally, the pre-cartilaginous stage of these secondary centers is present in utero.

In our case, and in the cases of Owen (1953), the ossification for the inferior rim failed to develop. We believe that this represents a congenital

From the Departments of Radiology, Veterans Administration Hospital, Minneapolis, Minnesota, and University of Minnesota.

BILATERAL GLENOID HYPOPLASIA—KASPER AND JORGENS

tal anomaly. The flattening of the humeral heads, limitation of range of motion, axillary webbing, and degenerative arthritic changes all appear secondary to the congenital alteration at the glenohumeral joint.



Fig. 2. Axial view showing normal relationship of the head of the humerus to the glenoid. Arthritic change is again noted along the articular surface of the humerus.

Discussion

Birth trauma to the shoulders may result in a deformity that is somewhat similar, though several differentiating points may be made. Scaglietti (1938) reviewed 199 cases of obstetrical injuries to the shoulder, and found the disability to be due to joint trauma in the majority of cases, rather than from nerve injury. He demonstrated fractures through the epiphyseal plate of the proximal humerus. Roentgenograms taken immediately after birth frequently failed to show evidence of fracture, the injury being apparent only on later examinations, after callus had been formed. This type of trauma resulted in shortening of the humerus, deformity of the head, limitation of motion at the shoulder joint, and partial posterior dislocation of the head of the humerus. This latter deformity is due to inward and backward rotation of the head fragment, following the epiphyseal separation. Frequently in these cases dysplasia of the inferior portion of the glenoid becomes noticeable at three to four years of age. In our case bilaterality of involvement, lack of posterior dislocation, absence of evidence of old

epiphyseal separation, and normal length of the humeri all tend to rule out birth trauma as the etiologic factor.

Fairbank (1947) described twenty cases of dysplasia epiphysialis multiplex, a congenital abnor-

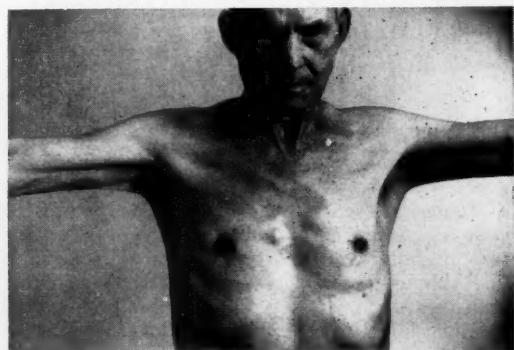


Fig. 3. Frontal view of the patient, with the arms abducted to their fullest extent. The webbing of the posterior axillary folds is well shown.

mality of multiple epiphyses resulting in dwarfism. In this condition the epiphyses show mottling and irregularity. Several roentgenograms included in his paper show deformity and apparent absence of the inferior glenoid rim. Fairbank does not believe this disease is hereditary or familial.

Five cases of bilateral glenoid hypoplasia have been reported by Owen (1953). He considered these cases congenital in origin, with no hereditary or familial factors involved.

Two cases of congenital abnormalities of the shoulder were described by Andreasen (1948). In these patients the humeral heads were flattened, and the articular surfaces of the glenoids were convex. He also reviewed six cases reported by Lewin, Muller and Brailsford, all quite similar, with concave humeral heads and convex glenoids. He believed the primary defect to be failure of normal development of the humeral capital epiphysis.

Brailsford (1948) reported three cases, showing a bilateral defect in the formation of the glenoid. These occurred in two women and one nine-year-old girl. In these cases, the glenoid was flat and had no lower lip. He believed the etiology to be failure of development of the epiphysis for the lower rim of the glenoid. His

(Continued on Page 596)

Current Concepts

SURGICAL TREATMENT OF CORONARY ARTERIAL DISEASE

JOHN W. KIRKLIN, M.D.
Rochester, Minnesota

Since an editorial is, by definition, an article giving the views of its author, it would appear permissible to write one on the surgical treatment of disease of the coronary arteries. At the present state of knowledge, it would not appear advisable that a definitive report be written concerning this subject. In my opinion, the data available with regard to operative procedures in both experimental animals and man are not sufficient to allow final conclusions as to the efficacy of operations for coronary arterial disease. This is not to deny the merits of the publications made by the various workers who have contributed so greatly to this field; it is merely to emphasize that conclusions concerning the value of operations for coronary arterial disease must be considered tentative in the light of the incompleteness of the material so far available.

Coronary arterial disease may be considered as a form of segmental arterial occlusion in which the occlusion affects the vital left and right coronary arteries or their branches. These occlusive changes, either acute or chronic, result in ischemia of portions of the cardiac muscle. Secondary myocardial changes may stem from this deprivation of blood supply. Although the myocardial changes may be severe or even fatal, the occluded coronary artery itself remains the basic problem. Therefore, surgical efforts in this disease must be directed toward improvement of the blood supply to ischemic parts of the myocardium if they are to be done with a view to cure. Palliative surgical measures performed in the hope of relieving distress must not be confused with procedures aimed at producing an increased blood supply to the heart.

Many methods have been used by surgeons throughout the years in an attempt to improve blood flow to the heart in patients who have disease of the coronary arteries. Attempts have been made to stimulate the ingrowth of myriads of extremely small vessels by the production of pericardial adhesions or of adhesions between the heart and such organs or tissues as the pectoral muscle, the omentum or isolated loops of intestine. The implantation of the internal mammary

artery into the ischemic myocardium recently has been proposed as a more direct approach to the problem of bringing arterial blood into the cardiac muscle. Anastomosis between the aorta and the partially occluded coronary sinus is another method of attack on the same problem. As the result of experimental studies, little doubt remains concerning the ingrowth of new vessels from either adhesions or implanted vessels.

A critical question remains: Do these procedures truly increase the blood supply to the myocardium and by virtue of this increased blood supply relieve the pain of angina pectoris and prolong life? Opinions that these operations do effect such changes can be found expressed in the literature. It is of great importance to the surgeon to arrive at his own opinion as to the merits of these operations. He must constantly see patients with coronary arterial disease who seek relief, even though it be by a major operation, from the burden imposed by the occlusive disease of the coronary arteries. It is not sufficient that the surgeon offer an operation to the patient. He must, indeed, advise the patient either for or against a surgical attempt to improve the blood supply to the myocardium.

It is to be admitted that the evidence to date is not conclusive as to the value of such operations. The surgeon must balance this against the known mortality rates of the various operative procedures. If in his opinion the chances of obtaining significant benefit from the operation justify the mortality rate involved, he may wish to advise patients under his care to submit to such operations. If, on the other hand, he remains unconvinced from the evidence presented that operations for disease of the coronary arteries are significantly prolonging the life and increasing the comfort of the patients receiving this type of treatment and particularly if he feels that the mortality rates from these operations are higher than are acceptable for a procedure that is not of proved value, then he probably will advise patients not to have operations for coronary arterial disease at the present time but to seek management of the disease by other methods of approach. Research into the surgical treatment of this common affliction continues and further evidence may cause the surgeon to alter his own opinions on this matter.

From the Section of Surgery, Mayo Clinic, Rochester, Minnesota.

Laboratory Aids

Sponsored by
The Minnesota Society
of Clinical Pathologists
George G. Stilwell, Editor

BLOOD COAGULATION

CHARLES A. OWEN, JR., M.D.
Rochester, Minnesota

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CINE

Much research has been devoted to the process by which blood coagulates. Because the techniques and vocabulary of coagulationists are not familiar to many clinical pathologists and to most practitioners, publications in this field remain practically unnoticed in specialty journals.

When the pathologist does set out to perform tests for "prothrombin consumption," "prothrombin utilization" or "thromboplastin generation," or "P and P" tests, he finds the reagents difficult to prepare and unstable once prepared, and he finds the methods capricious. So he returns to the performance of clotting and bleeding times and the "prothrombin-time" test of Quick, thus offering no more than he did fifteen years ago. This is unfortunate, since the characterization of coagulation defects appears to be on a sounder basis than ever before. Recognition of these defects is usually not too difficult, and the patient's need for fresh or stored blood or for vitamin K often can be anticipated by the laboratory.

First Step of Clotting

Clotting may be divided into four steps. The trigger mechanism apparently is an interaction between certain substances from platelets and several factors in plasma. Hemophilia and its clinically indistinguishable variants lack this triggering device. In hemophilia, a specific plasma protein (antihemophilic globulin, or AHG) is lacking or is blocked by an inhibitor. Coagulation is inefficient in either case despite normal concentration of the other clotting factors. In PTC deficiency, the missing factor is "plasma thromboplastin component." If plasma lacks a third protein, namely "plasma thromboplastin antecedent," another disease (PTA deficiency) like hemophilia results.

From the Section of Clinical Pathology, Mayo Clinic and Mayo Foundation, Rochester, Minnesota.

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AUGUST, 1955

Hemophilia is transmitted as a sex-linked recessive, that is, from the grandfather through the mother to the son. It can occur in the female only if both parents transmit the gene, which is extremely rare. PTC deficiency, a sixth as common as hemophilia, also is a disease of males in alternating generations, apparently transmitted as a sex-linked recessive. PTA deficiency occurs in either sex and in successive generations; it is probably carried by a dominant gene and is the least common of the three congenital diseases affecting the initial step of clotting.

Surprisingly small amounts of fresh normal blood or plasma will correct *in vitro* the error in hemophilia. Correction is progressively less efficient as blood is stored for a number of days. However, stored blood corrects the prolonged clotting time of blood deficient in PTC. Treatment of fresh normal plasma with chemicals, such as barium sulfate or calcium phosphate, destroys the effect of plasma on PTC-deficient blood without altering its effect on hemophilic blood. Both stored and chemically treated plasmas correct PTA deficiency (Table I).

TABLE I.

| Patient's abnormality is: | Clot time of patient's whole blood or plasma is shortened (+) or not (-) by addition of: | | | |
|---------------------------|--|----------------------|--|--------------|
| | Fresh normal plasma | Stored normal plasma | Normal plasma treated with BaSO ₄ | Normal serum |
| Hemophilia | + | - | + | - |
| PTC deficiency | + | + | + | + |
| PTA deficiency | + | + | + | + |

It requires only a little ingenuity to prepare these plasmatic reagents and distinguish the types of hemophilioid abnormality by determination of the effect of such agents on the clotting times of whole blood or plasma. The importance of such distinction is that fresh blood or plasma is vital in the treatment of hemophilia, whereas stored blood is satisfactory for treatment of deficiencies of PTC and PTA.

Second Step of Clotting

During the second step, active thromboplastin is developed as the result of interaction of the products of the first step with two additional proteins in plasma. In man, one of these proteins (labile factor) disintegrates rapidly with storage of blood. The second protein (stable factor) resists storage and, like PTC, is readily removed from plasma by barium sulfate.

Characterization of deficiencies of factors in the second step of clotting is simple. If either labile or stable factor is reduced, the clot time as determined by the Quick test is prolonged. Despite the similarity of labile factor to AHG and of stable factor to PTC, results of the Quick test usually are normal in the hemophilic group of diseases.

Congenitally, labile factor is reduced in parahemophilia. This disease can affect both sexes in consecutive generations, and its inheritance has certain of the genetic properties of a dominant gene. In certain diseases, stable factor also may be lacking on a genetic basis; just as in parahemophilia, this characteristic is an incomplete dominant and is not sex-linked.

The commonest error of coagulation is acquired deficiency of stable factor. This factor is reduced primarily, and prothrombin is reduced secondarily, by use of bishydroxycoumarin (dicumarol) and related drugs. Insufficiency of stable factor is the primary defect in deficiency of vitamin K and in hemorrhagic disease of the newborn. In advanced hepatic disease, both labile and stable factors, as well as prothrombin, tend to decrease, and eventually the concentration of fibrinogen also may be reduced. In all these conditions, the clot times as measured by the Quick test are lengthened.

Differentiation of abnormalities of labile and stable factors merely involves performance of the Quick test on the patient's plasma with added stored plasma or plasma treated with barium sulfate (Table II). If stable factor is reduced, a normal-appearing plasma leads one to suspect administration of a dicumarol type of drug, whereas if the plasma is icteric, obstructive jaundice or severe hepatic damage comes to mind, the differentiation being made by the patient's response to use of vitamin K; if the plasma is water clear, the presence of sprue or other enteric diseases that prevent absorption of fats and fat-

soluble vitamins, such as vitamin K, might be considered.

Third and Fourth Steps of Clotting

The third step involves conversion of prothrombin to thrombin under the stimulus of the thromboplastin produced during the first two steps. Depletion of prothrombin alone is perhaps the rarest of clotting abnormalities. When it is lacking, an accompanying deficiency of stable factor almost invariably is present. The final step of clotting, and the only one visible, is the enzy-

TABLE II.

| Patient's plasma lacks: | Clot time (Quick test) of patient's plasma is shortened (+) or not (-) by addition of: | | | |
|--------------------------------|--|----------------------|--|--------------|
| | Fresh normal plasma | Stored normal plasma | Normal plasma treated with BaSO ₄ | Normal serum |
| Labile factor Stable factor | + | - | + | - |

matic (thrombin) conversion of soluble fibrinogen to insoluble fibrin.

Congenital afibrinogenemia has been found in both sexes in successive generations, but it is probably transmitted by a recessive gene. Acquired deficiencies of fibrinogen recently have received much attention. In certain conditions, notably prostatic carcinoma and hypoxic shock, the blood appears to clot well but the clot tends to disintegrate or become lysed. In such cases, an active clot-destroying enzyme, namely, fibrinolysin, usually can be found in the blood.

Another condition is being reported clinically as "afibrinogenemia." This is a severe, even fatal, bleeding tendency seen at times in patients with abruptio placentae. The coagulationist is puzzled by the clinical diagnosis of "afibrinogenemia" because he may find a practically normal concentration of fibrinogen in the plasma associated with a potent fibrinolysin. In other instances, when fibrinogen is actually lacking, a deficiency of most of the other clotting factors, as well as of platelets, also exists. It appears much as if the patient's erythrocytes were suspended in serum rather than in plasma, probably because of absorption of clot-promoting substances from the placenta or uterus, with resultant intravascular coagulation.

Although the logical treatment in bleeding with abruptio placentae is use of whole blood or plasma, the diagnostic term "afibrinogenemia" has led

(Continued on Page 589)

HEXAMETHONIUM-INDUCED HYPOTENSION

FREDERICK H. VAN BERGEN, M.D.
Minneapolis, Minnesota

Induced or controlled hypotension has met with both great favor and disfavor among surgeons and anesthesiologists since its introduction by Gardner in 1946.¹ Later proponents have advocated the procedure for operations of such diversity as skin grafting, fenestration, sympathectomy and craniotomy. They have pointed especially to the advantages achieved in surgical exposure, reduction of the operative and anesthetic course, and diminution of blood loss. Certain surgical procedures which heretofore were impossible now have achieved actuality.²

Without doubt, deliberate hypotension does have these several virtues. However, the most casual survey of the current literature convinces the reader that the procedure may increase the morbidity and mortality rates beyond those which existed before its use. In response to a survey questionnaire in 1953,³ British clinicians reported 21,125 cases of controlled hypotension. Of these reported cases, 553 major complications (3 per cent) and forty-six deaths (0.2 per cent) implicated the technique. Further, since there was approximately a 50 per cent response to the questionnaire, these statistics probably did not reflect the true number of complications attendant upon the use of this method.

The fact that surgical exposure is improved in certain operations associated with induced hypotension might serve as a strong indication for its use, but only if the added risk is fully appreciated. While the operative and anesthetic courses are appreciably shortened, little information is available concerning the role the *duration of anesthesia* and surgery *per se* plays in increasing the anesthetic mortality and the postanesthetic morbidity or mortality. The availability of whole blood for transfusions has not presented too great a problem in this locality, but it is conceivable that in some communities the lack of stored whole blood might limit the type and extent of necessary surgery.

Since purposeful hypotension carries with it certain risks and benefits peculiar to the technique, a series of studies were undertaken to examine more exactly the alterations which occur in various physiologic processes when anesthetized man is exposed to hexamethonium-induced hypotension. An analysis of such information should delineate some of the advantages, disadvantages, indications and contraindications more clearly. The following discussion is based largely upon the conclusions of the investigations completed at the University of Minnesota.⁴

Inaugural thesis presented before the Minnesota Academy of Medicine, November 10, 1954.

Effects on the Cardiovascular System

Arterial Blood Pressure.—Within thirty seconds after a single intravenous injection of hexamethonium, the blood pressure began to fall, and it reached its maximum depth within five minutes. The duration of action of a 25 mg. intravenous dose varied from fifteen to fifty minutes. Twenty-five to 50 mg. of the ion produced an average systolic fall of 48.8 per cent and an average diastolic fall of 44.2 per cent below the pre-injection level. The degree of hypotension obtained appeared to be a function of several variables which are common to most operative procedures. Among those to be considered specifically were the dosage of hexamethonium, the depth of anesthesia, the operative position of the patient, the pre-anesthetic blood pressure level and the presence of shock.

The evidence indicated, for example, that there was a point beyond which the blood pressure could not be reduced by additional dosages of hexamethonium. While the maximum effective intravenous dosage appeared, on the average, to be in the vicinity of 50 mg. of the ion, greater quantities of the drug merely prolonged the duration without increasing the degree of the ensuing hypotension. Such findings were consistent with the accepted theory embodying chemical blockade of the effector apparatus in the autonomic nervous system. They demonstrated clinically the achievement of maximum pharmacologic effects without the appearance of toxicity symptoms.

The extent of the induced hypotension was proportionate to the depth of anesthesia. When a rise in blood pressure occurred in the lightly anesthetized patient who was refractory to additional doses of hexamethonium, the blood pressure diminished to the initial hypotensive level when the depth of anesthesia was increased. Correspondingly, this effect was reversed as the patient recovered from anesthesia. Such a reaction might be ascribed either to a reduction in the tone of the skeletal muscles surrounding the vascular bed, or to a depression of the central vasomotor apparatus by the anesthetic agents, or perhaps to a combination of these events.

Induced hypotension also could be augmented if the patient was placed in Fowler's position. The angle the torso assumed to the horizontal directly influenced the blood pressure response. Thus a change from the supine position to 10 degree Fowler's position further decreased the average systolic blood pressure 22.6 per cent and diastolic pressure 15.3 per cent. A change from the

HEXAMETHONIUM-INDUCED HYPOTENSION—VAN BERGEN

supine position to 15 degree Fowler's position decreased the average systolic pressure 39.7 per cent. This was most probably the effect of gravity upon a relatively inert vascular bed.

Next, the percentage fall in blood pressure concomitantly appeared as a direct function of the pre-anesthetic blood pressure level. The normotensive patients had an average fall in systolic pressure 36.2 per cent, while among the hypertensives the average systolic fall was 46.4 per cent. In like manner, the average diastolic fall in the normotensive group was 37 per cent, while in the hypertensive group the average diastolic fall was 42.6 per cent. Individuals with symptoms and signs of increased intracranial pressure experienced systolic drops averaging 48.9 per cent and diastolic falls averaging 47.0 per cent following the administration of hexamethonium.

Venous Pressure.—The initial effect of hexamethonium upon the venous pressure was dependent primarily upon the position of the patient at the time the drug acted. Fowler's position favored a fall in venous pressure, while the supine or Trendelenberg positions predisposed to rises in venous pressure. Once hexamethonium attained its maximum effect, the subsequent venous pressure variations closely paralleled those of the arterial pressure. It was not surprising to find that factors which modified arterial pressure modified venous pressure in the same direction.

Circulation Time.—Alterations in circulation time assumed an inverse relationship to the blood pressure changes in these patients. The arm to ear circulation time was fourteen seconds in one individual with an initial systolic blood pressure of 174 mm. Hg. Following the administration of hexamethonium, his systolic pressure fell to 66 mm. Hg and the circulation time nearly doubled its original value. This result was consistent with the data on changes in cardiac output and peripheral resistance.

Cardiac Output.—Cardiac output studies were performed on twelve patients in the horizontal supine position in the following manner. General anesthesia was induced and maintained with the standard pentothal-curaré-nitrous oxide technique. Studies were withheld for a period of twenty minutes in which time the investigator could monitor the vital signs and be reasonably certain that a steady state of cardiovascular function was present. Cardiac output was then estimated by the Hamilton dye method and simultaneous blood pressure and pulse measurements were recorded. After these determinations, hexamethonium was administered intravenously in incremental doses until a systolic blood pressure level of from 70 to 100 mm. Hg was attained. At this point, a second estimation of cardiac output was made together with blood pressure and pulse measurements. Because of the experimental nature of these investigations, care was taken that a severe drop in systolic pressure did not occur. Although the technique of controlled hypotension often involves blood pressure levels lower than those produced in this segment of the

study, the additional value of the data obtainable by producing extreme hypotension did not justify the added risk involved.

The results of these studies are shown in Table I. Hexamethonium-induced hypotension produced an average decrease in cardiac output of 15.27 per cent in the anesthetized individual.

Electrocardiographic Changes.—Purposeful hypotension produced electrocardiographic signs typical of myocardial hypoxia, and the severity of the signs was a function of the degree of hypotension. Similar electrocardiographic signs of myocardial hypoxia were produced at blood pressure levels approaching normality, but were achieved by diminishing the amount of oxygen in the inspired anesthetic mixture. Further, the signs evoked by either hypotension and/or atmospheric hypoxia could be terminated readily by increasing the oxygen concentration in the inspired anesthetic mixture.

It was significant that the tracings obtained after four minutes of atmospheric hypoxia (10 per cent oxygen) with a blood pressure of 80 mm. systolic and 60 mm. diastolic were not as abnormal as the tracings obtained with an inspired oxygen concentration of 50 per cent and a blood pressure of 65 mm. systolic and 55 mm. diastolic.

Cardiopulmonary Phenomenon.—Positive atmospheric pressure-artificial respiration, with an inspiratory phase equal to one-third of the respiratory cycle, had very little effect upon the arterial pressure of patients under hexamethonium blockade. A 5 mm. Hg systolic excursion occurred when respiration was augmented. Diastolic excursions were altered even less. Constant positive intrapulmonic pressure of a moderate degree (6 mm. Hg) caused little change in the arterial pressure, while positive intrapulmonic pressure of a high degree (15 mm. Hg) produced a marked decline in arterial pressure with complete obtundation of the pulse pressure. Release of this sustained pressure evoked a gradual return of the blood pressure to the initial level without overshoot.

Atmospheric Hypoxia and Hypercapnia.—An inspired oxygen concentration of 10 per cent (80 mm. Hg) for a four-minute interval induced a further gradual fall in the blood pressure of individuals under the influence of hexamethonium from 85 to 74 mm. systolic and from 65 to 57 mm. diastolic. Administration of 100 per cent oxygen restored the blood pressure to its pre-hypoxic level.

A five-minute hypercapnic period produced no change in blood pressure, in spite of the fact that the alveolar carbon dioxide concentration attained a level of 18 to 20 per cent (as measured by the Nier mass gas spectrometer). These observations are the distinct converse of those observed in anesthetized individuals who are not given hexamethonium. In the latter, hypoxia and/or hypercapnia produced an initial rise in blood pressure.

Altered Response to Peripherally Acting Vasoconstrictors.—Individuals under hexamethonium blockade have a markedly increased response to adrenergic agents, paral-

HEXAMETHONIUM-INDUCED HYPOTENSION—VAN BERGEN

TABLE I.
EFFECT OF C₆ ON CARDIAC OUTPUT

| AGE | DOSE OF C ₆ | BLOOD PRESSURE | | PULSE RATE | | C.O. | | CHANGE in % |
|---|------------------------|---|--|---|--|--------------------------------------|---------------------------------------|-------------------|
| | | PRE.-C ₆ B.P. in mm.Hg | POST.-C ₆ B.P. in mm.Hg | PRE.-C ₆ PULSE (beats/min) | POST.-C ₆ PULSE (beats/min) | PRE.-C ₆ C.O. L/min | POST.-C ₆ C.O. L/min | |
| 55 | 25 | 110/70 | 75/ | 82 | 76 | 2.4 | 2.0 | -18% |
| 48 | 75 | 125/85 | 80/50 | 76 | 72 | 4.8 | 4.0 | -18% |
| 54 | 175 | 130/80 | 100/ | 78 | 74 | 7.39 | 4.25 | -42% |
| 29 | 25 | 118/75 | 80/ | 106 | 92 | 2.91 | 2.85 | -2% |
| 22 | 125 | 120/80 | 105/ | 100 | 84 | 3.1 | 2.8 | -10% |
| 46 | 75 | 145/90 | 90/60 | 88 | 80 | 3.8 | 3.17 | -16% |
| 30 | 50 | 120/80 | 80/ | 84 | 82 | 3.0 | 3.0 | 0 |
| 27 | 75 | 120/75 | 100/70 | 78 | 74 | 5.0 | 5.8 | +16% |
| 47 | 50 | 130/80 | 90/ | 72 | 74 | 3.9 | 3.0 | -23% |
| 34 | * 25 | 90/70 | 70/ | 84 | 88 | 2.0 | 1.58 | -21% |
| 55 | 50 | 130/75 | 85/ | 80 | 74 | 2.71 | 1.79 | -33% |
| 11 | 75 | 130/65 | 85/40 | 72 | 96 | 2.55 | 2.13 | -16% |
| Average, 38.2 | 68.75 | 122.3/77.1 | 86.7/- | 83.3 | 80.5 | 3.63 | 3.03 | -15.27% |
| * VERY RAPID INDUCTION CAUSED BLOOD PRESSURE CRASH BEFORE C ₆ GIVEN. | | | | | | | | |

telling the increased sensitivity to these agents seen in other sympathectomized individuals. Since hexamethonium virtually produces a chemical sympathectomy, any vasopressor administered while an individual is under hexamethonium blockade should be diluted and administered in increments about one-fourth the usual therapeutic dose until the desired blood pressure level is obtained.

The exaggerated vasopressor response was observed in one hexamethonized patient who was given 4 mg. of methoxamine hydrochloride (Vasoxyl®) intravenously. Within twenty seconds, a violent pressor response occurred, and the pressure rose from 110 to 340 mm. systolic and from 90 to 270 mm. diastolic.

Effects on the Central Nervous System

Anoxia Photometer Readings.—Changes in arterial pressure did not alter ear oxygen saturation significantly in patients under hexamethonium blockade unless the patients were tilted to Fowler's position. When this maneuver was executed, oximeter readings fell significantly and consistently. Similar falls in oximeter readings occurred when high continuous positive intrapulmonic pressure was applied for three minutes.

Cerebral Arteriovenous Oxygen Differences.—Cerebral arteriovenous oxygen differences [C(A-V)O₂] increased significantly and consistently after hexamethonium when compared to pre-administration controls. Such increases can be returned to pre-hexamethonium levels by correcting the hypotension with vasopressors.

The average pre-hexamethonium arterial blood pres-

sure was 147.5 mm. systolic and 99.5 mm. diastolic, the pulse rate per minute 97 and the C(A-V)O₂ 6.85 volumes per cent. Following the administration of hexamethonium, the average arterial pressure fell to 63.5 mm. systolic and 46.6 mm. diastolic, with a rise in pulse rate to 115.5, and a rise in the C(A-V)O₂ to 8.55 volumes per cent. Upon abolishing the hypotension with vasoxyl, the average pressure rose to 120 mm. systolic and 84.5 mm. diastolic, the pulse rate fell to 91 and the C(A-V)O₂ returned to 6.67 volumes per cent.

Electroencephalographic Tracings.—Electrocorticograms have been run in synchrony with arterial pressure tracings in an indirect attempt to determine the extent of cerebral hypoxia, if any, during induced hypotension. Cortical activity, as manifested by the electrocorticogram, progressively diminished as the blood pressure declined. In one case when the arterial pressure reached 55 mm. systolic and 45 mm. diastolic, all activity ceased. When a vasopressor was administered at this point, cortical activity reappeared with the rise in blood pressure.

Discussion

The foregoing findings indicate that hexamethonium chemically denerves all structures under autonomic nervous control. Under such denervation, all reflexes having autonomic components as their efferent limbs are blocked, thus abolishing reflex-compensating mechanisms involved in normal circulatory homeostasis. The conversion of a patient's vascular bed from a high pressure system to a low pressure system is, no doubt, the result

HEXAMETHONIUM-INDUCED HYPOTENSION—VAN BERGEN

of dilatation of both the active vascular beds and the reservoirs. This increase in the capacity of the vascular bed will permit a pooling of blood in the more dependent portions of the body while the more elevated parts become ischemic. Of primary concern, then, is the alteration which occurs in the physiology of vital organs, namely the brain, the heart, the liver and the kidneys.

The Brain.—The ear oximeter tracings, C(A-V)02, electrocorticograms, and visual detection of cerebral cyanosis all indicate a marked decrease in the rate of cerebral circulation, particularly when the patients are placed in Fowler's position. Stagnant hypoxia must be the explanation for these unfavorable changes. The development of cerebral thrombosis could easily be accounted for by the reduction in the cerebral blood flow rate.

The Heart.—The reduction in blood pressure, heart rate and cardiac output should result in a decreased coronary blood flow. Simeone⁵ showed that the coronary arterial blood flow as measured from the outflow at the coronary sinus was decreased by 33 per cent in the patients studied. In the presence of a diseased coronary artery system, a reduction in the flow rate through it could lead to coronary thrombosis. Doubtless, the work of the left ventricle is decreased during the hypotensive state and, as a result, the oxygen requirement of the heart should be less, yet electrocardiographic studies revealed changes consistent with myocardial hypoxia.

The Liver.—Mueller⁶ has shown that the rate of hepatic blood flow is decreased significantly during purposeful hypotension. Associated with this was a decrease in the hepatic vein oxygen tension. Splanchnic oxygen consumption and vascular resistance did not change significantly.

The Kidneys.—Anesthetized patients subjected to purposeful hypotension develop marked oligemia or anuria. Glomerular filtration rates have been shown to be markedly reduced. Intravenous phenolsulfonphthalein administered at the onset of hypotension did not appear until five hours later. Certainly, the risk of renal failure must be considered another potential complication of hypotensive procedures.

The weight of evidence indicates that the induction of hypotension adds considerable risk to the anesthetic and surgical management of the patient. Although purposeful hypotension is a valuable addition to the anesthesiologists' armamentarium, the risk involved must be very carefully calculated in terms of the surgical procedure to be accomplished on a specific patient.

Conclusions

1. The action of hexamethonium on the arterial and venous pressures is presented. A single 25 mg. dose of hexamethonium produced an average fall of 48.8 per cent in the systolic pressure and 44.2 per cent in the diastolic pressure. Factors which influence the magnitude of this effect are enumerated and discussed. Pre-existing hypertension, deep anesthesia, Fowler's position and shock exaggerated the pressure drop produced by hexamethonium. The venous pressure tended to parallel the arterial pressure except on induction of hypotension and during positive intrapulmonary pressure.

2. Circulation times, C(A-V)02 and anoxia photometer studies were correlated with the arterial pressure. Each of these tests provided evidence of circulatory impairment incompatible with good tissue blood flow.

3. Electrocardiographic and electroencephalographic studies were done for the purpose of detecting heart and brain hypoxia during the hypotensive state. In both instances, evidence of severe hypoxia was present.

4. Alterations in the pharmacologic responses to hypoxia and hypercapnia, as produced by hexamethonium, were studied. Neither oxygen want nor excessive carbon dioxide produced a pressor response in patients with hexamethonium ganglionic blockade.

Purposeful hypotension becomes dangerous when the capacity of the total blood reservoir exceeds the blood volume since it is possible to render the brain ischemic by placing the patient in a steep Fowler's position.

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President's Letter

AMERICAN MEDICAL EDUCATION FOUNDATION

Some four or five years ago, the American Medical Education Foundation was founded under the sponsorship of the AMA. Since that time, about \$7,000,000 has been raised to assist the financing of medical schools.

The original contribution by the AMA was one-half million dollars, as a sort of pump-priming project, hoping that the members of the Association would take it upon themselves to carry on this laudable project. Since that time the AMA has kept up this contribution for four years, until this last year when, due to budget deficiencies, the contribution was decreased to \$100,000. Dr. Louis W. Bauer, president of the American Medical Education Foundation, stated in Atlantic City this year that it was now up to the medical profession or members of the Association to take up the slack so that the contribution to our medical schools would be as much as in previous years.

Medical schools do need more income. Although they are better supported today than any time in history, their operating costs have increased greatly. Do we want the government to subsidize our medical schools and so control them?

Income from tuition constitutes only 19.5 per cent of the total operating budget, and it is estimated that it costs from \$12,000 to \$15,000 to train a physician, and yet the average student's total four-year tuition is only \$2,532. We, as physicians, do owe a debt to our medical schools, aside from the fact that we must keep them from government domination.

At the 1955 session of the House of Delegates of the Minnesota State Medical Association, it was voted to place solicitation for this project at county society level, with the hope that more effective results might be obtained in raising our state quota. County society committees will be supervised by a state-wide committee headed by Dr. H. E. Drill. It is the hope of the House of Delegates that this method of solicitation will bring Minnesota's contributions up to the desired standard of other states.

Our individual duties in respect to this fund are emphasized by the fact that our own state medical school has received much more from the Foundation than has been contributed in our state. It was a revelation to me to note that other states have made such magnificent contributions and we have done so little here in our own state.

Let's all get behind this project. Let us willingly serve on, or aid our local county committees. Let us all give annually to the American Medical Education Foundation.

Arnold O. Swenson

President, Minnesota State Medical Association

Editorials

JOHN F. BRIGGS, M.D.
ARTHUR H. WELLS, M.D.
HENRY G. MOEHRING, M.D.

HEALTH EXAMINATIONS

Recently an official of a corporation made arrangements for an annual physical examination for a number of key men in his organization. Above everything else, he stated that the company would insist upon a complete gastrointestinal x-ray study because one of the company's officials in Ohio had died of cancer of the bowel not many months after a study which did not embody a specific roentgenologic search for the possibility of colon malignancy.

This naturally brings up the question as to what should be done to constitute a "complete examination"—how far should one go?

The latitude allowed in such examinations depends on the amount set aside for such a purpose on the patient's behalf and may be restricted to a physical examination, often with an electrocardiogram and a chest x-ray, and in some more extensive examinations, to what might be called "the works."

Some clients assume that a thorough study can be made with only an analysis of the history of the patient and an examination of the body by the physician with a few laboratory tests. Other examinees are not content unless a survey includes, in addition to these fundamentals, an electrocardiogram, x-rays of the chest, abdomen, complete gastrointestinal study and probably one of the urinary tract as well. It may be enlarged by certain blood chemical studies, a metabolism test and consultations with various specialists such as the ophthalmologist and an otolaryngologist on one end of the body, and the urologist and proctologist on the other. A minimal examination of the type mentioned could be done for \$10; the latter would represent an outlay of probably up to \$150 per patient.

Unfortunately, the patient believes that a favorable report is carte blanche to health, but every physician knows from experience the fortuitous errors which may arise in any examination, and chagrin and haste to explain do not mollify the patient or his family when disaster follows up to a year after a "thorough" examination.

A good physician naturally wonders as to what he may do to give the patient confidence in the health survey which is so constantly urged in our periodicals, and how efficient the results may be.

Since the examination is based much upon the capacity to pay, whatever is done should be done as conscientiously as possible. I believe that preparatory to any examination, a thorough history is of exceeding importance. It not only offers leads to follow in conducting the physical examination, but also yields information relative to the personality and environmental factors which are also of utmost importance. Especially is the latter true because, to the patient and even to many physicians, the physical possibilities seem paramount.

Another most important element is the thoroughness of the physical examination by the physician, aided possibly by an examination in the more specific specialties. With these elements as the basis of an examination, laboratory data and the desired electrophysical methods may be added, the latter depending upon the apparent need in the judgment of the physician.

When the patient is dismissed and is informed concerning all abnormal findings and conclusions, and advice is given as to their correction and relief, the patient frequently says, "So I'm all right, doctor, everything else is O.K. with me." The examining physician who knows in his heart that no examination and no series of tests are infallible, should tell the patient in all honesty that so far as he can tell, with the information at his disposal and the examination, conditions may appear entirely normal and satisfactory, but that illness may always develop by chance and that no examination can be considered proof against inadvertent accidents of medicine. On the other hand, if a physician makes a good survey of a patient, he can assure him by pointing out that after an examination is completed and no gross abnormalities found, he may be considered quite free from the possibility of early disaster.

F. J. Hirschboeck, M.D.

MINNESOTA MEDICINE

THE SPECIALTY OF OTOLARYNGOLOGY

Probably no specialty has benefited more from the impact of the sulfanamides and antibiotics on its activities than has otolaryngology. Relieved of the burden of caring for a large amount of suppuration in the temporal bone, the nasal space, and the throat, the otolaryngologist is devoting greater activity toward the unsolved problems that are so numerous in his specialty, and the specialty is benefiting from this inquiry.

This inquiry, in turn, demands a broader base of preparation. That fact has led to a higher standard for certification. Today, preparation for the specialty requires a minimum of three years of graduate training in a residency. That has lessened the interest of those who would combine the practice of ophthalmology with otolaryngology. That combination was an American creation, and its existence probably delayed research in otolaryngology. However, that combination is disappearing as witnessed by the fact that there are no more combined residencies approved by the certifying boards. Some are concerned about a theoretical need for the combined practice of these specialties for small centers of population. This has been answered elsewhere. (Boies, L.R.: The future of otolaryngology. *Laryngoscope*, 62:709-721, 1952).

In recent years, there has been a noticeable dearth of applicants for residency training in otolaryngology. Probably one reason for this was the impression prevalent in some areas that the sulfonamides and antibiotics had so altered the opportunities in the specialty that there was very little work left.

Applicants are now more numerous. The number of approved residencies has been reduced by eliminating institutions where the faculty and teaching material are inadequate for the broad training in otology, rhinology, laryngology and broncho-esophagology that the specialty demands.

Today, there is a large demand for the services of one who is adequately trained.

Opportunities for continuation study beyond the residency stage are as numerous in otolaryngology as in any other specialty. There is easy access to the instructional courses and conferences of the American Academy of Ophthalmology and Otolaryngology offered annually on a week-long basis. The methods of graduate teaching by this organization have been widely copied in other

specialties. Beyond the Academy, there are four additional special societies with years of background (American Laryngological, Rhinological and Otological Society, Inc., American Broncho-Esophagological Society, American Otological Society, American Laryngological Association) whose annual programs reporting research and clinical studies are open to the profession, and in recent years new groups have been established for the intensive study of specific problems such as allergy, otosclerosis, plastic procedures, etc.

Truly, there seem to be few specialties in which there is so much opportunity today.

LAWRENCE R. BOIES, M.D.

LIFE INSURANCE IN A PHYSICIAN'S ESTATE PLANNING

The large insurance programs carried by many physicians indicate acceptance of insurance as the fundamental element of their estates. Life insurance possesses several features which make it the ideal foundation of a family protection program.

1. It eliminates the time element usually required for the accumulation of property. The insurance estate is created immediately upon the acceptance of an application by the insurance company and the payment of a premium.

2. The finest investment services in America safeguard the funds which underlie the life insurance contracts.

3. The distribution of the insurance estate, if payable to named beneficiaries, is accomplished without the delay or expense of probating. In addition, the insurance companies are willing to distribute the funds in regular installments, or hold them at interest for the beneficiaries, according to mutually agreeable modes of settlement. Furthermore, they guarantee the safety of all funds held in their custody, as well as a minimum rate of interest.

Insurance contracts are more wisely chosen if one will lay out a "blue-print" of the total insurance estate he wants ultimately to own, before he buys several uncorrelated policies. Then, in order to reduce the danger of uninsurability, it is well to acquire the entire program as soon as possible by the purchase of ordinary life or convertible term contracts. These can be changed later, as circumstances warrant, to forms with

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improved paid-up, endowment or retirement benefits.

Should the proceeds be distributed to heirs in lump sum or in restricted installments? There is no simple rule, the manner of settlement depending on personal and family conditions. Is the beneficiary a prudent person, or a spendthrift? Are the proceeds to be used to pay debts and taxes, or to provide regular income to dependents? The answers to such questions help determine the best mode of settlement.

Just as the lawyer should be employed in planning the descent and distribution of one's general estate, so should a competent life underwriter be consulted in arranging an insurance estate settlement plan. For the same reasons that one's will should be revised periodically, with the change of family conditions, likewise should the insurance program be enlarged or modified from time to time, in order that the distribution of the proceeds will be consistent with the insured's current family and financial situation.

DEAN H. FIELD, C.L.U.
Chartered Life Underwriters

FUNCTION OF THE STATE INSURANCE COMMISSION

The Division of Insurance, headed by the Commissioner, is charged with the enforcement of all laws of this state relating to insurance. The department is divided into the following subdivisions: Rating, Agents' Licenses, Examining, Cashier and Accounting, Complaints—legal, Statistics. Each of these subdivisions or functions is headed by a supervisor.

The Commissioner of Insurance who also is the State Fire Marshal, has other duties to perform, such as being a member of the Compensation Insurance Board, a trustee of the Teachers Retirement Fund, a member of the Board of Public Employees Retirement Association, and a member of the Insurance Board. The Insurance Commissioner, along with the Banking and Securities Commissioners, acts upon all matters pertaining to the Department of Commerce. A portion of the Commissioner's time is also taken up with membership in the National Association of Insurance Commissioners.

The Insurance Department has thirty-three employees.

At the present time, there are licensed in the State of Minnesota 155 township mutuals and 690 other companies. Of the 690 companies, there are 84 domestic companies with assets totaling approximately three-quarters of a billion dollars.

There are 18,750 agents licensed to do business in this state, and the number of licenses issued to these agents totals 73,129.

All domestic companies licensed and the agents licensed in this state are under the direct supervision of the Commissioner of Insurance, who is charged with the responsibility of examining the insurance companies once every three years as to their financial standing and treatment of policyholders.

Companies other than domestic insurance companies licensed in this state are also indirectly under the supervision of the Insurance Commissioner.

Inasmuch as all companies are required to file an annual statement which must be sworn to by the principal officers of the company, examination and analyses of these statements are made by an examining staff each year.

The Insurance Department also participates in the examination of insurance companies operating in this state, even though they are domiciled and chartered by other states, thus protecting the policy holders of this state who purchase insurance in other than domestic carriers.

There are a number of insurance companies, not licensed in the State of Minnesota, which solicit the citizens of our state through the mail. The Insurance Commissioner makes every effort to advise the citizens of this state not to purchase any insurance in any unauthorized carriers.

The 2 per cent premium tax collected from the insurance companies licensed in this state amounts to in excess of 6 million dollars annually. The miscellaneous receipts, such as company fees, agents license fees, et cetera, total in excess of \$207,000 annually, while the payroll and supplies and expenses to maintain the department each year total approximately \$163,000.

Each year about 7,000 individuals visit the department for information regarding matters pertaining to insurance.

CYRIL C. SHEEHAN
*Commissioner, State of Minnesota
Insurance Department*

THE PHYSICIAN AND THE DEATH CERTIFICATE

Completing and signing the certificate of death of a patient he has attended is about as unhappy a task as a physician can be called on to perform. It is, however, a legal duty he cannot avoid, and promptness in its performance not only facilitates the work of others but is a distinct service to the family of the deceased, as it is the purpose of this article to make clear.

When a family comes to a funeral director to make arrangements for a service, one of the first questions considered is the day of the funeral. Usually, the family prefers to have the service and interment within two or three days. Before the body may be interred, however, a permit must be obtained from the Registrar of Vital Statistics under the provisions of Sections 144.181, 144.183 and 144.164 of the Minnesota Vital Statistics Law, which require that a death certificate properly completed and signed by the attending physician (or the coroner where no physician was in attendance) be filed with the Registrar before the permit may be issued. This makes it necessary for the funeral director to obtain as soon as possible the signature of the attending physician to the death certificate.

Understanding co-operation between the physician and the funeral director will facilitate the work of both.

It is, of course, the responsibility of the funeral director to present to the physician a death certificate completed with the exception of the physician's diagnosis and signature. Many funeral directors feel that the doctors are uncooperative in this matter. Physicians are busy people, but if they will let the funeral directors in their community know the method they would prefer them to use in presenting death certificates for their signature, they will find the funeral directors only too glad to comply. If the usual practice of having a member of the funeral director's staff deliver the certificate to the doctor's office and wait until it is signed is felt objectionable, the certificate can be mailed to the doctor with a stamped, addressed return envelope. In such case, however, the doctor's assistant should be instructed to bring it to his attention promptly upon receipt and to see that it is promptly mailed after he has signed it.

It should be mentioned, in this connection, that

when it is not possible for the doctor to state the cause of death definitely when the certificate is presented to him, he does not need to delay the signing of the certificate for that reason. Under the provisions of Section 144.164 of the Minnesota Vital Statistics Law, the attending physician may indicate on the certificate over his signature "diagnosis deferred," if the cause of death cannot be determined before interment or within five days, if interment is delayed.

In such case, the physician should enter in the medical certification portion of the death certificate—"diagnosis deferred," and sign and date it and return it to the funeral director. In due time, the State Registrar will provide the doctor with a form to be completed and returned to him so that the cause of death can be entered on the death certificate.

Besides their necessity for burial purposes, death certificates are important to the family of the deceased for other reasons. Among the purposes for which they are needed may be mentioned the collection of insurance, the cashing of jointly held bonds, the transfer of joint bank accounts, the conveyance of real estate held in joint tenancy, social security benefits, and veterans' benefits. Unnecessary delay in the completion and filing of the death certificate may obviously create hardship in the family. Correct, well-executed certificates are an oft overlooked source of good will for the years to come.

(MRS. JOHN) DOLORES O'HALLORAN

BUSINESS PROSPECTS FOR 1955

The best phrase I have heard to describe 1955 is that it will be a year of competitive prosperity—in other words, a good year for those who recognize the need to compete for business with all the ability at their command. Indeed, it may turn out to be our No. 1 peacetime year.

As we look into the future, we see exciting potentialities for growth in the food processing industry. There is a strong trend toward the use of more prepared foods—enabling the housewife to have more time to spend on her home and with her family.

Nutritional research and flavor research offer us some of the most fascinating possibilities. The Nutrition Foundation, an organization for research financed by many of the food manufacturers, is today studying a wide range of subjects

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of nutritional importance. The same is true of a good many of our colleges and universities and government agencies. And, of course, companies like ours are continually studying nutritional needs and the effects of foods in meeting these needs.

We can assume that almost everyone enjoys food that is delicious, so it's a real consolation to know that *enjoyment of food is important nutritionally*. It is interesting that a good deal of attention is being given today to the basic nature of flavors and how to improve them.

As we learn more, we also learn that the scope for future development is broader than we imagined. Nowhere in the American economy is this observation more true than in agriculture and in farm yields. For example, in the 1940's we all thought that 10 tons of tomatoes per acre was a fine achievement. Today, 10 tons is only a fair crop. With what has been learned, and can be learned, about new plant varieties, new soil treatments, new sprays and new growing methods, it is not at all unrealistic to foresee an average of 20 tons per acre of redder more perfect tomatoes that taste better and have superior food values. The changes taking place in tomato growing parallel those for other agricultural products. What has happened in the past as to farm yields and what we believe is in store for us in the future tell something of the capability of the agricultural industry. I doubt that there is any cause to worry about feeding the growing population as far ahead as you and I can see—and a lot farther.

We are a rich and growing nation. Births last year reached a record high of 4 million. There are estimates that the population will hit 200 million by 1970. The potentialities for progress seem almost unlimited. Speaking for the company I know best, Campbell's business has been on an upward trend for a long time. If this trend continues—and there's every reason to think it will—the year 1955 should be the biggest and best in the company's history.

WILLIAM B. MURPHY
President, *Campbell Soup Company*

HISTOPLASMOSIS

(Continued from Page 537)

symptoms and signs due to infection with *H. capsulatum*. One of the children had fatal disseminated histoplasmosis. The results of a preliminary survey of skin sensitivity in the area of the site of the outbreak indicates that a point source of infectious spores exists there. In addition, the survey uncovered a higher incidence of reactors to histoplasmin than has previously been known to exist in this area. These data suggest that physicians in Minnesota should consider histoplasmosis in attempting to determine the etiology of certain pulmonary syndromes resembling atypical pneumonia. More information is needed concerning the rate of skin sensitivity to histoplasmin, as an index of the prevalence of the fungus in the state of Minnesota.

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Medical Economics

STATE SEVENTH HIGH IN OLD AGE ASSISTANCE

According to a recent bulletin from the Minnesota Taxpayers Association, the State of Minnesota is now seventh highest in the nation in payment for old age assistance. Only six states pay more for old age assistance than Minnesota.

The bulletin states that "the average payment to old age recipients for the country as a whole is \$51.90 a month, while Minnesota's average payment is \$65.12. Minnesota is \$13.22 a month higher than the average for the country."

The Taxpayers Association also notes that if Minnesota's payments averaged the same as the country as a whole, the bill to taxpayers would be \$8,261,013.36 a year less, based upon the figures for December, 1954.

Further figures show that one out of every six persons over 65 years of age in the state of Minnesota is receiving an old age pension. "The actual figure for Minnesota is 176 recipients out of each 1,000 persons over 65," the bulletin states.

The organization also points out that the proportion of old age pensions in the state is slightly less than the average for the country: The U. S. average is 183 per 1,000 persons aged 65 and over.

Among the midwest states that pay less than Minnesota are: Wisconsin, \$62.44 per recipient; Iowa, \$57.02; Michigan, \$54.43; Ohio, \$57.59; Indiana, \$47.53; and Illinois, \$59.69.

MORE FUNDS URGED FOR FDA

A special committee, which for five months has been investigating problems of the Food and Drug Administration, recommends that this agency have more money to work with, that it be authorized to hire more trained personnel, and that its administrative structure be improved. The above information is reported in a recent issue of the American Medical Association's "Washington Letter."

Staff Noted

The committee's staff, appointed by Secretary of Health, Education and Welfare, Oveta Culp Hobby, was under the chairmanship of G. Cullen

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

Thomas, vice president of General Mills, Inc. Its membership included Dr. Harry Dowling, professor of medicine at the Illinois University; Dr. Leonard A. Maynard, director of the School of Nutrition at Cornell University; and Dr. Charles Franklin Poe, dean of the College of Pharmacy, Colorado University.

The committee's recommendations are:

"1. The FDA's personnel and facilities should be expanded three or fourfold, appropriations should be sufficient to finance the broader program, FDA should be given a modern building to house its Washington operations.

"2. An educational and informational program should be developed in the immediate office of the Commissioner. Its purpose should be a wider dissemination of more positive information to industry, the professions and the public.

"3. The FDA general counsel should have an 'adequate appropriation and staff' so legal actions can be 'prosecuted vigorously.' Actions should not be resorted to unless necessary.

"4. The headquarters staff should be strengthened to make possible better programming and internal management of FDA affairs."

VETS MEDICAL CARE TO GET NEW APPRAISAL

A recent issue of the "Washington Report on the Medical Sciences" notes that an eleven-state conference has been scheduled for September 27, in Indianapolis, in an attempt to "close the rift between the American Legion and organized medicine on medical care benefits for war veterans." The report states that Washington participation is assured.

The meeting will be sponsored by the Indiana State Dental and Hospital Associations, the Indiana Department of the American Legion and the state medical association's joint liaison committee. Invitations to attend have been extended to their counterparts in Illinois, Iowa, Kentucky, Ohio, Michigan, Minnesota, Missouri, Nebraska, Pennsylvania and Wisconsin. Also, to managers of 54 veterans hospitals in those states.

Guest Speakers

Prominent persons in all phases of this particular problem are slated to talk to the conference. From Washington, program speakers will include

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Dr. William S. Middleton, chief medical director of Veterans Administration; T. O. Kraabel, director of rehabilitation, American Legion, and Dr. Dallas G. Sutton, representing the American Hospital Association. Also, Dr. Elmer Hess, Erie, Pennsylvania, president of the American Medical Association, will speak to the conference. Dr. Norman R. Booher is to be chairman.

STOP ABUSING HOSPITAL INSURANCE

A recent article in *Reader's Digest* shows how "free-loaders" are driving up the cost of insurance, and it also shows how this abuse of hospital insurance can be stopped. The article is written by Blake Clark.

The article, available in reprint form from the AMA, notes several examples of gross abuse of hospital insurance. Among them is the story of a couple who wanted to go on vacation, but could not find suitable baby sitters for their children while they were away. Their doctor said, "That's easy — just bring them to the hospital." So the children were admitted to the hospital, the insurance company payed the bill and professional baby sitting was had for a period of two weeks, at considerable cost to the insurance company.

The article states: "Let's not fool ourselves: if we do not look out, we are going to kill the goose that lays the golden eggs that pay our hospital bills. This kind of abuse drives up the price of hospital insurance for everyone. Some hospital-insurance rates have already been raised six times in eight years."

The Michigan State Medical Association has set up a committee to look into this abuse. The committee examined 12,102 cases in 25 typical hospitals and found "faulty use" of hospital facilities by 31.1 per cent of the insured patients; only 12.4 per cent of the uninsured were at fault. Four kinds of abuse were revealed: overstay, admission for diagnosis only, hospitalization merely for convenience, and unnecessary treatments.

Who's to Blame?

The article says that doctors cause most of the trouble "by sending patients to hospitals for diagnosis and treatment which could be handled in the physician's office; by permitting patients to remain in hospital longer than is necessary; and by carelessly continuing expensive treatment when the need is past." However, it also states

that physicians are not alone in the blame. The article notes:

"Hospitals carelessly run up expenditures for unneeded tests and medications. And the patient himself is too often at fault. Typical is the patient who says, 'As long as I'm here, how about an electrocardiogram and an x-ray picture of my stomach?' His attitude is, 'Shoot the works, Doc; I'm covered.'

"Insurance agencies themselves are not blameless. They permit advertising that says, in effect, 'We pay everything,' and picture a happy family saved a disastrous \$3500 in hospital charges."

How to Control?

A job of controlling such abuses is being done in Cincinnati, the article goes on. Though hospital costs have skyrocketed as fast in Ohio as elsewhere, Cincinnati's largest hospitalization program has increased fees only once in the past five years and has added hundreds of thousands of dollars to reserves. They did it by making all parties involved aware of the consequences of faulty use.

James E. Stuart, executive director of Cincinnati's Hospital Care Corporation, recently told his physician friends: "We are all in this boat together, plan officials, subscribers, hospitals and you—but the steering is in your hands. You decide who shall be hospitalized, when and where he is to be admitted, how long he will stay and what services will be provided."

Also, county medical societies and hospital officials are now working together to try to lick the problem. When one hospital administrator saw that his institution spent two dollars more per day per patient than his neighbor, he made his staff find ways to bring costs into line. The article reports that when a doctor forgot to cancel expensive medication and ran up an unnecessary bill of nearly \$1000, the group put into effect a ruling that all prescriptions must be renewed every three days or the drugs are automatically canceled. "This and similar controls have resulted in substantial savings," the article notes.

Further, Stuart and his group have made it easier for the physician to resist patients' requests for undue "co-operation," the article points out. It says:

"A plaque prominently displayed in the doctor's waiting room outlines the services which Hospital Care Corporation does *not* cover. This gives the doctor official support when he must tell a member that hospital fees

MEDICAL ECONOMICS

solely for diagnostic study or checkup are not underwritten.

"Stuart estimates that enlisting the co-operation of doctors, hospitals and patients has resulted in savings of \$1,500,000 a year for Hospital Care Corporation."

The article concludes: "The Cincinnati record shows that an honestly used hospital plan can give the protection it promises, without rate increases that sooner or later will make it too costly for those who need it most."

FEE ADVICE FOR YOUNG PHYSICIANS

Advice on the What, How and When of setting up fees, has been outlined recently for young physicians just starting practice. This article is found in a new publication of the Mead Johnson Company, called *Mead Digest*. The booklet is designed especially for residents and interns, but is applicable to the established practitioner as well.

Actually, the article states, "the fee problem need not be complicated if sound basic principles are followed from the beginning. According to leaders in the field of medical economics, you can handle the whole subject smoothly if you plan your action in three progressive steps:

1. Establish a fair fee schedule.
2. Inform the patient of the fee in the proper manner.
3. Pursue a systematic collection system."

Regarding the proper fees to charge, the publication states that there is no easy answer because fees differ in various communities and in different parts of the country. The best way is to check with the county medical society and other physicians, the article advises young doctors. "Many medical societies have worked up informal average fee schedules which can serve as a guide to local physicians in setting their charges," it goes on to say.

The article quotes some tips from the AMA which have been set up to guide doctors on their fee schedules:

"Charge enough to command respect."

"Set fees consistent with the average patient's ability to pay."

"Adjust fees on a cost basis only."

"Don't put bargain rates on medical care; this tends to lower quality."

"Give the best medical service possible per medical dollar."

One of the most important things for a young physician to consider is the prior discussion of fees with the patient, and also sending itemized bills rather than lumping the charge in one.

Why Patients Don't Pay

Along this same line, the same issue of *Mead Digest* summarizes a recent survey of patients in California who had not paid their medical bills. These figures represent delinquent accounts only, not the physicians' entire practices. Out of the 1,560 patients surveyed, 19 per cent had not paid because of financial hardships at the time; 20.23 per cent had not paid because of poor business methods in the doctor's office, including no billing, insufficient information to trace "skips," statements not itemized, and no collection follow-up in the doctor's office; 3.4 per cent were dissatisfied with the medical services; 2.04 disclaimed any responsibility for the bill; 2 per cent thought the fee was excessive; 21 per cent had not been informed by the doctor of some of the financial arrangements, such as x-ray charges and other costs; 9.61 per cent were negligent and slow to pay bills; .86 per cent were classified as deadbeats.

The survey, made by the Alameda County Medical Society and the California Medical Association, noted: "When steps were taken to correct the above difficulties, collections increased as much as 25 per cent. What is more important, patient satisfaction increased proportionately."

"IDEAL" SOCIALIZED MEDICINE

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in all these peoples. Now is the time for the physicians to forget their personal desires and look to saving our present philosophy of freedom by aiding in the establishment of a program that supplies enough sufficiently soon—for if we do not, others shall be glad to head the paternalism!

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Miscellaneous

PROPOSED PLAN OF INSURED ENDOWMENT FOR THE AMERICAN MEDICAL EDUCATION FOUNDATION

Working under the assumption that the financial needs of medical education in the United States will continue to exceed the moneys normally available from regular income sources, (i.e., tuition, interest on investments, annual gifts from alumni and general funds of the university allocated for the operation of the medical school) a constant search has been maintained to find a method whereby the Foundation will be assured of a more permanent income to meet the medical profession's quota in the national campaign to raise \$10,000,000 annually for medical education.

To this end, many fields have been explored; legislation at state levels to increase dues to meet the giving load, volunteer committees, direct mail efforts and others, too numerous to mention at this point. The plan outlined in the following paragraphs has many advantages and, from this observer's point of view, the advantages far exceed the disadvantages that might arise.

In selecting an income plan for consideration, several basic factors had to be considered; they were: (1) a plan that would automatically include the bulk of America's practicing physicians, (2) a plan that would benefit the Foundation as well as the individual participant, (3) one that would identify the medical societies with the effort and relieve it of the financial strain that the current campaigns placed upon their reserves, (4) one that would conceivably give the State Society something tangible to add to services being rendered to its members and, at the same time, make it more attractive to other physicians who might consider membership, and (5) create a steady flow of funds into the Foundation's treasury in excess of \$2,000,000 annually, thereby permitting the Foundation to acquire a degree of permanence and build a hard core of liquid assets that could be invested with the returns used to further assist medical education.

It is believed that the following plan will accomplish all these basic needs and still remain attractive to the membership of the state and local medical societies.

It is suggested that the state societies consider the following insurance endowment plan as a possible means of creating a stable and continuing source of income for the American Medical Education Foundation. If found acceptable, the plan should be presented to the House of Delegates for their further consideration and action. I am of the opinion that a \$1,000, twenty-year endowment policy on each member of the association can be written on a group basis, with no evidence of insurability requirements. Participation would be limited to active dues-paying members up to and including age sixty-five. This will allow the full twenty-year span on all members before attaining age eighty-five.

Assuming that we are working with an even number block of 100,000 eligible members at the inception date

of the plan, this would immediately provide a \$100 Million Dollar endowment fund.

During the first few years, we could expect approximately 2,000 deaths per year. Proceeds from these death claims, which would be payable to the State Society or the Foundation direct, would produce upwards of \$2,000,000 per year in income to the Foundation. Of course, as this original group grows older, the death rate will increase, and we can estimate that it will eventually reach 3,000 per year, which would result in \$3,000,000 per year being paid in claims to the Foundation. If we now strike an average of 2,500 deaths per year during the 20-year endowment period, we see that approximately \$50,000,000 would be paid in death claims, and at the end of the period, the balance of \$1,000 per living member would become payable in a lump sum as an endowment. This amount would be the other \$50,000,000.

Thus, we see that during the 20-year period \$1,000 will be paid to the Foundation on every life insured, either as a death claim or as an endowment at the end of the period.

Assuming that the average annual premium will work out at about \$50 per \$1,000, you will note that whereas the first year's premium would be approximately \$5,000,000, this total annual premium would reduce each year as deaths occur, leaving fewer to pay for the succeeding year. While I am not an actuary, I believe that the total premium that might be expected to be paid during the 20 years would approximate \$80,000,000 but \$100,000,000 would be returned either in death claims or endowments. This gain of \$20,000,000 would come from the investment income made on the funds received each year by the insuring company. This is life insurance at work.

The increasing value of the funds on deposit with the insurance company is reflected in the increasing cash or loan value of each certificate and would grow each year as renewal premiums are paid. These funds would be available, for loan purposes, to the owners of the certificates, (State Societies) and the funds could be made available to individuals such as interns, residents, and young doctors who have finished their training and need help in getting set up in practice. Thus, the Endowment Fund not only provides the ways but the means for helping the young doctors who are a product of these schools. This feature, made possible by a plan of this kind, is very important since it brings into being a new, very vital activity for the State Society and should stimulate membership.

So far, I have dealt insurance wise only with the original group which has been estimated at 100,000, who would be eligible at the inception date of the plan.

Now, assuming that there are 6,000 potential new

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

members going into practice each year, this would mean adding \$6,000,000 new insurance each year, the bulk of which would be at the younger ages. This would reduce the average rate of the entire group and eventually bring the average age down into the thirties, and the rate down below the estimated \$50 per \$1,000 mentioned above.

As in the case of the original group, death claims would be paid as they occur on these new members. Since this group in itself, is younger and the mortality rate is lower, death claims will be fewer, resulting in a lower return per year to the Fund from death claims. However, this will result in more certificates maturing as endowment, thus increasing the amount payable at the end of the endowment period. As in the case of the first group, each certificate issued in subsequent years on these new members will pay off in full either as a death claim or as a matured endowment so that \$1,000 is paid off on each life eventually, live or die.

Since it is proposed that this insurance be paid for out of state dues,* the premium as part of these dues would be tax deductible for the individual doctor. Now, if we can assume that the average doctor reached the 50 per cent Income Tax bracket, Uncle Sam will actually be paying one-half of the cost involved and instead of a \$50 increase in cost of membership, there would actually be a \$25 net increase in annual outlay on the part of the member doctor—which would appear to be a very insignificant amount to produce such terrific results.

Any further information you may need or want, I will be glad to develop for you. In order to establish a definite rate for the original group, we would need the following data:

- (1) Distribution of present membership by attained age.
- (2) Deaths in 1953 by attained age at death (can be lumped for ages over sixty-five).

*Dues, for doctors who survive the 20-year endowment period of their individual certificate, could be reduced at the end of the endowment period. Twenty-year participation on the part of any one doctor is all that has been contemplated in this proposal.

PAINFUL SHOULDER

(Continued from Page 558)

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THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

230 Lowry Medical Arts Building
Saint Paul 2, Minnesota

F. H. Magney, M.D., Secretary

SAINT PAUL WOMAN SENTENCED FOR ABORTION

Re: State of Minnesota vs. Assunda Willner, also known as Sue Willner

On July 11, 1955, Assunda (Sue) Willner, forty-five, 343 West Central Avenue, Saint Paul, Minnesota, entered pleas of guilty before the Hon. Ronald E. Hachey, Judge of the District Court of Ramsey County, to two informations, one of them charging her with the crime of abortion and the other charging her with having a prior conviction for a felony, and the Court continued the matter to July 18 for sentencing the defendant. Mrs. Willner had previously been convicted of the crime of abortion in Ramsey County District Court on October 9, 1947. When Mrs. Willner again appeared before Judge Hachey on July 18, she was sentenced to a term of not to exceed eight years in the State Reformatory for Women at Shakopee, Minnesota, the sentence being suspended and the defendant placed on probation on condition that she would depart from the State of Minnesota by midnight and remain outside of the state forever. The court also provided that the defendant must report to the Probation Officer in the place where she intends to reside and also that she must keep the Ramsey County Probation Officer informed in reference to her place of residence.

In sentencing the defendant, Judge Hachey stated that he had given a great deal of thought to the case and he had no difficulty whatsoever in reaching the conclusion that the defendant is a bad risk for ordinary probation since she had taken advantage of everyone who had ever given her a "break" in her entire lifetime. Judge Hachey added that when he was a prosecutor in the office of the United States District Attorney, he had experience with narcotic peddlers and "white slavers," but he had never had a case involving an abortionist, although he puts them all in the same class. After telling Mrs. Willner that she had reached in life what he considers the "low of lows", Judge Hachey said that he was only sorry that he could not sentence her to a term of ten or fifteen years, but he realized that if she was sent to the reformatory for the maximum term of eight years she would perhaps be paroled after a few years and that was too good for her. The Court warned Mrs. Willner that if she returned to the State of Minnesota after midnight, she would very likely have to serve out the full eight years in that event.

The abortion which was performed by Mrs. Willner on May 8, 1955, upon a thirty-two-year-old Minneapolis woman, who was married and the mother of three children but separated from her husband, came to the attention of the authorities when the patient began to hemorrhage as a result of the abortion and was taken to Minneapolis General Hospital. The defendant was paid the sum of \$300.00 for the abortion, which she performed by means of a catheter. In addition to the prior conviction for abortion, Mrs. Willner has two convictions for practicing healing without a basic science certificate, one in 1942 and another in 1951. In the first case, the defendant was placed on probation, whereas in the 1951 case she was sentenced to serve sixty days in the Ramsey County Jail. Mrs. Willner holds no license to practice any form of healing in the State of Minnesota.

In Memoriam

WILLIAM PITTS ABBOTT

Dr. William P. Abbott, former Duluth physician, was found dead in his home on Thursday, May 19, 1955. He had died on Tuesday or Wednesday. Dr. Abbott was seventy-four years old.

A resident of Faribault in his youth, Dr. Abbott attended Shattuck School. He graduated from the University of Minnesota Medical School in 1906 and entered general practice in Duluth in 1907.

Ill health forced him to retire from active practice in 1933, and he moved to a location near Grand Marais, Minnesota. At the time of his death, he was living alone with his dog. On Tuesday before his death, the dog was struck by a car and killed. Two days later, Dr. Abbott was found by a neighbor after the mailman reported that he had not picked up his mail.

Dr. Abbott had been a member of the St. Louis County Medical Society and the Minnesota State Medical Association.

A son, Agatin T. Abbott, a university professor of Moscow, Idaho, and a sister, Mrs. C. W. Newhall of Morristown, survive.

HERBERT BAKERAITKENS

On June 6, 1955, Dr. Herbert B. Aitkens, one of the early physicians in Le Center, died at his home. He had been a bed patient for two years. He was eighty-eight years old.

Born in Highcliff, England, Dr. Aitkens came to Canada when he was nineteen. After attending the University of Manitoba in Winnipeg, he attended medical school at the University of Minnesota, graduating in 1893.

In 1894, Dr. Aitkens located in Le Center. He was a board member of St. Paul's Episcopal Church and served on the school board for many years. In 1944, a banquet was held honoring him for his fifty years of service in the community. Four years later, he retired because of failing health.

He was past president of the Nicollet-Le Sueur County Medical Society and a life member of the Minnesota State Medical Association. In 1943, he became a member of the Association's "Fifty Club."

Mrs. Aitkens, the former Anna E. Barker, survives her husband. Dr. Aitkens also leaves a daughter, Mrs. A. G. Tuberg of Glendale, California, and two step-sons, Frank Aitkens of Minneapolis and Leonard Aitkens of Mamaka, Alberta, Canada.

WILLIAM HENRY AURAND

Dr. W. H. Aurand, eighty, a Minneapolis physician since 1901, died July 17, 1955. He was born at Green Bay, Wisconsin. He attended Minneapolis Central High School and the University of Minnesota, graduating from the medical school in 1901.

Dr. Aurand interned at St. Barnabas Hospital, where in 1938 he became chief of staff.

He was an active member of the Hennepin County Medical Society, serving on the Executive Committee and as a delegate to the Minnesota State Medical Association from that county society. He was a life member of the State Association and had been a member of the "Fifty Club" since 1951.

Dr. Aurand is survived by his wife, Jane; a son, Calvin, Des Moines, Iowa; and a sister, Mrs. Harry G. Slyder, Sioux Falls, South Dakota.

PAUL ARTHUR O'LEARY

Dr. Paul A. O'Leary, internationally recognized authority on diseases of the skin and syphilis, died in St. Mary's Hospital in Rochester, Minnesota, on July 20, 1955. Dr. O'Leary was born in Brooklyn, New York, on November 11, 1891, the son of Anna Belle Coy O'Leary and Jeremiah J. O'Leary. He was a student at Dartmouth College in 1910 and 1911, and at the Long Island College of Medicine, from which he received the degree of doctor of medicine in 1915. In 1915 and 1916, he was an intern in the Long Island College Hospital in Brooklyn.

Dr. O'Leary came to Rochester, Minnesota, on January 1, 1917, as an assistant in dermatology and syphilology in the Mayo Clinic. In August of that year he was appointed to the staff of the Mayo Clinic. From 1917 to 1919, he was a first lieutenant in the Medical Corps of the National Army. In May, 1924, when Dr. John H. Stokes left the Mayo Clinic, Dr. O'Leary was named to replace him as head of the Section of Dermatology and Syphilology. He retained that post until July, 1953, when he became a senior consultant. His tenure as a member of the staff of the Mayo Clinic was longer than that of any other active member now living.

Dr. O'Leary lived through an era which witnessed all but the absolute eradication of a devastating disease that had afflicted man for ages past. When he was a young man the treatment of syphilis was far from satisfactory, and it remained so for many years. Treatment was cumbersome to administer and tiresome to the patient because of the need for repetition. Dr. O'Leary applied himself to the study of this stubborn disease at the very outset of his career, and his first published paper was devoted to that subject. He did important work in the investigation of syphilis as it affects various internal organs, particularly in the abdominal cavity and the nervous system; and he was an early worker in the application of high fevers and inoculation with malarial organisms in the treatment of syphilis of the central nervous system. Finally, as he approached the end of his active career in medicine, the antibiotic drugs were introduced, and the importance of new infections with syphilis was thereby rendered almost negligible.

Many honors came to Dr. O'Leary in recognition of his long devotion to the study of syphilis and such diseases of the skin as scleroderma, a condition in which

IN MEMORIAM

the skin becomes thickened, hard, rigid and hidebound; and dermatomyositis, in which the skin, underlying tissues and muscles become involved by inflammation. In 1936 and 1937 he was chairman of the section on dermatology of the American Medical Association, and in 1946 he was elected president of the American Dermatological Association. He was also elected to the presidency of the American Academy of Dermatology and Syphilology, of which he was one of the founders, and the Minnesota Dermatological Society and the Chicago Dermatological Society. In 1926 he had published, with Dr. John H. Stokes, and others, the volume, *Modern Clinical Syphilology*; in 1947 he was appointed editor-in-chief of the *Archives of Dermatology and Syphilology*. In 1939 he was appointed a member of the National Advisory Health Council by Secretary of the Treasury, Henry Morgenthau, Jr. He served also as chairman of the dermatoses investigating committee of the United States Public Health Service. With the aid of a private grant, he organized a nation-wide co-operative system for the collection and exchange of information about diseases of the skin and syphilis which has since received international recognition and tribute. In 1940 he was secretary-general of the Tenth International Congress on Dermatology and Syphilology, and in 1951 he was president of the staff of the Mayo Clinic.

An entire issue of *The Journal of Investigative Dermatology* was dedicated to Dr. O'Leary in 1954. At that time the journal called attention to his international reputation in research and treatment, and the graduate training of young physicians in the specialty of diseases of the skin. More than 100 received such graduate training under Dr. O'Leary's direction.

Dr. O'Leary was certified as a specialist in dermatology and syphilology in 1933 by the American Board of Dermatology, Inc. He served as a member of that board from 1938 to 1948. He was a fellow of the American College of Physicians and a member of the New York Academy of Science, the Pan-American Medical Association, the American Association for the Advancement of Science, the Society for Investigative Dermatology, the American Association of University Professors, the Minnesota Academy of Science, Minnesota State Medical Association, Minnesota Academy of Medicine, the American Medical Association, Society of the Sigma Xi, Alpha Kappa Alpha, professional medical fraternity and Beta Theta Pi, academic fraternity. He was also an honorary member of the Royal Society of Medicine of England, the British Association of Dermatologists, the German Dermatological Society, the Berlin Dermatological Society, the Dutch Society of Dermatology and Syphilology, the Hellenic Anti-venereal Society of Greece, the Manhattan Dermatological Society and the Dallas Dermatological Society. In 1950 he was made an honorary member of Alpha Omega Alpha, national honor medical society. He was also a corresponding member of dermatological societies in France, Sweden, Greece, Denmark, Argentina and Hungary.

At one time he was keenly interested in fine horses, and often was called upon to act as judge at horse shows. He was also an early aviation enthusiast, an

interest that was developed particularly as a result of his friendship with the automobile and aviation industrialist, E. L. Cord. He was especially skilled in woodworking, an avocation which occupied much of his leisure moments.

Dr. O'Leary was married to Miss Ruth Youmans, of Winona, Minnesota, on June 18, 1921. Dr. and Mrs. O'Leary had two children: Paul Arthur O'Leary, Jr., of Los Angeles, California, and Patricia O'Leary, of Phoenix, Arizona.

BLOOD COAGULATION

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to stress on use of fibrinogen. Fortunately, commercial "fibrinogen" is a mixture of proteins and contains other clotting factors of some use to the patient; commercial "antihemophilic globulin," which contains even more of such factors, including fibrinogen, might be more useful. If intravascular clotting continues unabated in the pregnant patient, it is hard to conceive of plasma or any of its derivatives being satisfactory for therapy.

Much remains to be learned about the clotting of blood, particularly concerning biochemical characterization of the individual components and their interactions. The burden of transferring each new advance in research to the practice of medicine should be assumed by the clinical pathologist.

RADICAL TREATMENT OF BRAIN ABSCESS

(Continued from Page 550)

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Reports and Announcements

MEDICAL MEETINGS

National

Academy of Psychosomatic Medicine, 2nd annual meeting, Plaza Hotel, New York City, October 6-8, 1955.

American Association of Blood Banks, eighth annual meeting, Palmer House, Chicago, Illinois, November 19-21, 1955.

American Association of Obstetricians, Gynecologists and Abdominal Surgeons, the Homestead, Hot Springs, Virginia, September 8-10, 1955.

American Congress of Physical Medicine and Rehabilitation, Hotel Statler, Detroit, Michigan, August 28-September 2, 1955.

American Roentgen Ray Society, Palmer House, Chicago, Illinois, September 20-23, 1955.

American Medical Writers' Association, 12th annual meeting, Hotel Jefferson, St. Louis, Missouri, September 30, 1955, followed by Workshop on Medical Writing, October 1.

Association of Military Surgeons of the United States, 62nd annual convention, Statler Hotel, Washington, D. C., November 7-9, 1955.

Endocrinology and Metabolism, 7th annual Postgraduate Assembly of the Endocrine Society, Indiana University School of Medicine, Indianapolis, Indiana, September 26-October 1, 1955.

Mississippi Valley Medical Society, 20th annual meeting, Hotel Jefferson, St. Louis, Missouri, September 28-30, 1955.

National Society for Crippled Children and Adults, Palmer House, Chicago, Illinois, November 28-30, 1955.

Occupational Skin Problems, course sponsored by Institute of Industrial Health, University of Cincinnati, Kettering Laboratory, Cincinnati, Ohio, October 10-14, 1955.

Veneral Disease Postgraduate Course, 24th session sponsored by University of Chicago and Public Health Service, University of Chicago, September 26-30, 1955.

Winston-Salem Heart Symposium, Robert E. Lee Hotel, Winston-Salem, North Carolina, September 30, 1955.

State

Michigan State Medical Society, Pantlind Hotel, Grand Rapids, Michigan, September 26-30, 1955.

Montana Medical Association, Baxter Hotel, Bozeman, Montana, September 15-18, 1955.

International

International College of Surgeons, United States and Canadian sections, 20th annual congress, Convention Hall, Philadelphia, Pennsylvania, September 12-15, 1955.

International Symposium on Enzymes: Units of Biological Structure and Function, Henry Ford Hospital, Detroit, Michigan, November 1-3, 1955.

AMERICAN COLLEGE OF CHEST PHYSICIANS POSTGRADUATE COURSES

The Council on Postgraduate Medical Education of the American College of Chest Physicians announces two postgraduate courses on diseases of the chest.

The 10th annual postgraduate course, Hotel Knickerbocker, Chicago, Illinois, October 3-7, 1955.

The 8th annual postgraduate course, Park-Sheraton Hotel, New York City, November 14-18, 1955.

Tuition is \$75 for each course, which includes round-table luncheons. Further information may be obtained from the Executive Director, American College of Chest Physicians, 112 East Chestnut Street, Chicago 11, Illinois.

AMERICAN COLLEGE OF GASTROENTEROLOGY

The American College of Gastroenterology announces that its annual course in postgraduate gastroenterology will be given at the Shoreland in Chicago on October 27, 28 and 29, 1955. The course will again be under the direction of Dr. Owen H. Wangensteen, professor of surgery, University of Minnesota Medical School, who will serve as surgical co-ordinator, and Dr. I. Snapper, director of medical education, Beth-El Hospital, Brooklyn, N. Y., who will serve as medical co-ordinator.

The subject matter to be covered, from a medical as well as surgical viewpoint, will include the advances in diagnosis and treatment of gastrointestinal diseases and a comprehensive discussion of diseases of the mouth, esophagus, stomach, pancreas, spleen, liver and gall-bladder, colon and rectum, with special studies of radiology and gastroscopy.

For further information, write to the American College of Gastroenterology, Department P.G., 33 West 60th Street, New York 23, N. Y.

Minnesota physicians are invited to submit items "of general interest" concerning themselves or their colleagues for inclusion in this section. Items need not be written in finished form. All that is needed are the facts—answers to the old questions: who, what, where, when and why? Send information as desired to MINNESOTA MEDICINE, 2642 University Avenue, St. Paul 14, Minnesota.

AMERICAN GOITER ASSOCIATION AWARD

The American Goiter Association is offering the Van Meter Prize Award of \$300 and two honorable mentions for the best essays on original work on thyroid gland problems. The award will be made at the annual meeting of the association at Chicago, Illinois, May 3-5, 1956.

Essays may cover either clinical or research investigations, should not exceed 3,000 words in length and must be in English. Duplicate typewritten copies, double spaced, should be sent to the secretary, Dr. John C. McClintock, 149½ Washington Avenue, Albany, New York, not later than January 1, 1956.

REPORTS AND ANNOUNCEMENTS

NORTHERN MINNESOTA MEDICAL ASSOCIATION

The Northern Minnesota Medical Association will hold its annual meeting at Bemidji on September 2 and 3, 1955. The scientific program is as follows:

Friday, September 2

A.M.

- 10:00 "The Treatment of Varicose Veins." Dr. W. J. Deweese, Bemidji.
10:30 "Surgical Repair of Diaphragmatic Hernia." Dr. R. H. LaBree, Duluth.
11:00 "Post-partum Bleeding." Dr. W. F. Mercil, Crookston.
11:30 "Urinary Tract Infections." Dr. C. D. Creevy, Minneapolis.
12:30 Business Meeting.

P.M.

- 2:00 "Differential Diagnosis and Treatment of Pleural Effusions." Dr. W. R. Schmidt, Minneapolis.
2:50 "The Treatment of Diabetes." Dr. L. O. Underdahl, Rochester.
3:40 Panel Discussion: "Rheumatic Fever." Epidemiology—Dr. J. J. Coll, Duluth. Diagnosis—Dr. Emerson Ward, Rochester. Treatment—Dr. Harry Orme, Fargo, N. D.

Friday Evening

- 7:00 Annual Banquet. Principal speaker: Dr. Theodore H. Fenske, Assistant Dean, Institute of Agriculture, St. Paul.

Saturday, September 3

- 9:00-12:00 noon. Clinico-Roentgen-Pathological Conference. Led by Dr. Henry G. Moehring, Duluth.

ARTHRITIS AND RHEUMATISM FOUNDATION RESEARCH FELLOWSHIPS

The Arthritis and Rheumatism Foundation is offering three types of research fellowships in the basic sciences related to arthritis. Predoctoral fellowships range from \$1,500 to \$3,000 per year, depending on family responsibilities, and are tenable for one year with prospect of renewal. Postdoctoral fellowships range from \$4,000 to \$6,000 per year, depending on family responsibilities, and are tenable for one year with prospect of renewal.

Senior fellowships for more experienced investigators carry an award of \$6,000 to \$7,500 per year and are tenable for five years.

Deadline for applications is October 15, and awards will be made in January, 1956. For information and application forms, write the Medical Director, Arthritis and Rheumatism Foundation, 23 West 45th Street, New York 36, New York.

MINNESOTA CHAPTER OF ARTHRITIS AND RHEUMATISM FOUNDATION

The attention of physicians of the state is called to the newly organized Minnesota Chapter of the Arthritis

and Rheumatism Foundation. The state chapter will devote its efforts to aiding research, education and treatment in the field of rheumatic diseases.

Dr. Charles Slocumb, Rochester, is president, and Judge Paul S. Carroll, Minneapolis, is chairman of the Minnesota chapter.

A national fund-raising campaign will be held this coming November. Any inquiries can be directed to the Executive Secretary, R. V. Stevenson, 89 South Tenth Street, Minneapolis, Minnesota.

MINNESOTA ACADEMY OF GENERAL PRACTICE

The Minnesota Academy of General Practice will hold its fifth annual Fall Refresher at the Radisson Hotel, Minneapolis, on October 19, starting at 8:30 a.m. Eight hours of concentrated instruction will be given by fourteen authorities, highlighted by a talk by Dr. H. E. Ryneerson, Rochester, at the noon luncheon. Also appearing will be Dr. Bert Seligman, Toledo; Dr. Gene Stollerman, University of Chicago, and Dr. George Logan, Rochester.

There is no registration fee, but a five-dollar luncheon ticket is required. Registrations are advisable and should be made through Dr. James A. Blake, 15 Ninth Avenue South, Hopkins, Minnesota.

MINNESOTA HEART ASSOCIATION

Dr. J. A. Cosgriff of Olivia was elected president of the Minnesota Heart association for 1955-1956 at the annual meeting July 12 in St. Paul. Dr. Cosgriff, a past president of the Minnesota chapter of the American Academy of General Practice, succeeds Dr. Charles N. Hensel of St. Paul.

Other officers elected were Dr. Robert Parker, Mayo Clinic, first vice-president; E. B. Eliason, Minneapolis, second vice-president; Eugene L. Reichel, Minneapolis, third vice-president; Dr. Milton Hurwitz, St. Paul, secretary, and Bernard B. Knopp, St. Paul, treasurer.

A total of \$154,464 was allocated for heart research in the state during the next year.

WANGENSTEEN ANNIVERSARY PROGRAM

The Owen H. Wangensteen Surgical Education Foundation, a group made up of former residents of Dr. Wangensteen, is presenting a special program on September 22, 23 and 24, honoring the twenty-fifth anniversary of the appointment of Dr. Wangensteen to the chair of professor of surgery at the University of Minnesota.

The program will consist of a series of papers on surgical subjects given by present and former associates of Dr. Wangensteen. Included among the speakers will be Dr. John R. Payne, University of Buffalo; Dr. Clarence Dennis, New York University Medical School; Dr. Arnold Kremen, Columbia University Medical School; Dr. K. Alvin Merendino, University of Washington Medical School; Dr. David State, Cedars of Lebanon Hospital, Los Angeles; Dr. Irving Ariel, Pack

REPORTS AND ANNOUNCEMENTS

Medical Group, New York; Dr. George E. Moore, Roswell Park Cancer Institute, Buffalo, N. Y.; Dr. Edward E. Mason, University of Iowa Medical School; Dr. H. William Clatworthy, Children's Hospital, Columbus, Ohio, and members of the surgical department of the University of Minnesota.

On September 22 there will be an operative clinic in cardiac surgery, presented by Dr. Richard Varco, Dr. C. Walton Lillehei and Dr. F. John Lewis. There will be a public banquet on the evening of September 23, at which time the major address will be made by John Russell, executive director of the John and Mary Markle Foundation. A meeting of the Owen H. Wangensteen Surgical Education Foundation will be held on the evening of September 24. The surgical program will be presented in the Mayo Memorial Auditorium of the University of Minnesota Hospitals on September 23 and the morning of September 24.

A cordial invitation is extended to all physicians to attend this program.

CONTINUATION COURSES

The University of Minnesota will present its annual continuation course in *Radiology for Radiologists* at the Center for Continuation Study November 7 to 12. Subject of this year's program will be neuroradiology.

Guest faculty will include Dr. Donald L. McRae, chief of radiology, Montreal Neurological Institute, McGill University Faculty of Medicine, Montreal; Dr. Ernest H. Wood, Jr., professor of radiology, University of North Carolina School of Medicine, Chapel Hill; and Professor Erik Lindgren, professor of radiology, Serafimerlasarettet, Stockholm, Sweden.

The program will be presented under the direction of Dr. Leo G. Rigler, professor and head, Department of Radiology, and Dr. H. O. Peterson, clinical professor, Department of Radiology, University of Minnesota Medical School.

* * *

The University of Minnesota announces a continuation course in *Bacteriology and Blood Bank Techniques for Medical Technologists*, which will be held at the Center for Continuation Study from November 14 to 16. The course, which is open to all qualified medical technologists, will be presented under the direction of Dr. Ellis S. Benson, acting director, Hospital Laboratories.

Minnesota Academy of Medicine

Meeting of November 10, 1954

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, November 10, 1954. Dinner was served at 7 o'clock, and the meeting was called to order at 8:10 p.m. by the President, Dr. C. N. Hensel.

There were forty-eight members and two guests present.

The Secretary read a letter from Dr. S. E. Sweitzer asking that his name be transferred to the Senior List and stated that this had the approval of the Executive Committee. Upon motion, which was seconded, this was carried.

The Secretary read the memorial to Dr. Lee Barry, who died December 3, 1953.

A vote on the amendment presented at the October meeting was taken and this was carried.

Dr. Callahan introduced his guest, Dr. Dale Cameron; and Dr. Grant introduced his guest, Dr. McCloud, son of a former president of the Academy, Dr. C. N. McCloud.

Dr. Hensel appointed Drs. Hengstler (chairman), Spink and Regnier a committee to investigate the matter of a scholarship by the Academy, and make recommendations at a later meeting.

The scientific meeting followed.

Dr. Wallace D. Armstrong, of the University of Minnesota Medical School, read his Inaugural Thesis on "Radioisotope Studies of the Physiology of Calcified Tissues." Lantern slides were shown. (to be published later)

Dr. Frederick H. Van Bergen, of the University of Minnesota Medical School, read his Inaugural Thesis on "Hexamethonium-Induced Hypotension." (See page 573).

The meeting was adjourned.

ROBERT E. PRIEST, M.D., Secretary

Woman's Auxiliary

RAMSEY WIVES PLAN FALL FASHION FESTIVAL Mrs. L. G. Culver

On June 27, Mrs. H. O. Peterson, president of the Woman's Auxiliary to the Ramsey County Medical Society, called to order a special meeting held at the home of Dr. and Mrs. Donald R. Lannin, 1527 Edgcumbe Road, Saint Paul. The purpose of the meeting was to discuss changing the regular meeting day. Henceforth, the meetings of the Ramsey county auxiliary will be held on the third Monday of each month. It was a gorgeous day, the attendance was very good, and Lannin's beautiful lawn was enjoyed to the utmost.

There was considerable discussion about the Benefit Fall Fashion Festival, which will be held on Thursday, September 15, at the Hotel Saint Paul. Mrs. Rodney F. Sturley, general chairman of the event, reported plans are well under way. Proceeds will go to the American Medical Education Foundation and other philanthropic activities. Last year's show was very successful, and there is every reason to believe this one will be also. It isn't only in the spring that a lady's fancy turns to a new hat, suit, shoes and gloves! Tickets are available to everyone. Drop a card to Mrs. Charles Eginton, 1808 Beechwood, Saint Paul 5. Luncheon is \$3.00 and you may win a door prize!

Of General Interest

Dr. Sol Austrian, after four years of practice at Cosmos, began postgraduate study in pediatrics at the University of Minnesota in August. His practice in Cosmos has been taken over by **Dr. Russell A. Thompson**, a graduate of the University of Minnesota Medical School who recently completed his internship at St. Mary's Hospital, Duluth.

* * *

Principal speaker at a meeting of the Luverne Rotary Club on July 18 was **Dr. S. A. Slater**, head of the Southwestern Minnesota Sanatorium, Worthington. He reviewed the history and accomplishments of the sanatorium from its opening in 1919 but warned that "the battle against tuberculosis is not yet won."

* * *

A service recognition certificate was presented to **Dr. Frank J. Hirschboeck**, Duluth, at the annual summer meeting of the Minnesota Safety Council in Duluth on August 19.

* * *

Dr. and Mrs. Philip S. Hench, Rochester, left on July 30 for a three-week trip to Panama and South America. While in Rio de Janeiro, Dr. Hench presented two papers at the First Pan-American Congress of Rheumatology.

* * *

Dr. G. H. Mesker and **Dr. F. W. Penhall** were honored at the fifty-fourth annual Old Settlers Reunion at Hector late in July. Dr. Mesker practiced at Olivia for more than fifty years. Dr. Penhall, who was formerly on the staff of the Willmar State Hospital, now lives at Morton. Both physicians are retired.

* * *

Word has been received of the death of **Dr. Auguste Rollier**, who died on October 30, 1954, a month after his eightieth birthday in Lerpin, Switzerland, where he had lived most of his life. He was assistant to Professor Kocher of Berne after securing his license to practice there. He made many researches in heliotherapy and opened the first clinic for the treatment of surgical tuberculosis by sunlight with considerable success.

* * *

The practice formerly conducted under the name of Drs. Rutledge and Moberg in Detroit Lakes is now known as the Detroit Lakes Clinic. Associated with the clinic are **Dr. L. H. Rutledge**, **Dr. C. W. Moberg**, **Dr. M. E. Odland** and **Dr. Ernest S. Lorenzen**.

* * *

Seven physicians have been named as new members of the staff of the Mayo Clinic, Rochester. The new consultants are **Dr. Philip E. Bernatz**, **Dr. Norman P. Goldstein**, **Dr. Paul A. Green**, **Dr. Norman G. Hepper**, **Dr. John G. Mayne**, **Dr. Harold J. Swan** and **Dr. Richard A. Theye**.

AUGUST, 1955

Dr. Leo G. Rigler, chief of the department of radiology at the University of Minnesota, who is on a leave of absence from the university, has joined the staff of the City of Hope Medical Center in Los Angeles, California. While there, he will be director of postgraduate medical education and chief of x-ray diagnosis.

* * *

Dr. Arthur J. Henderson has been appointed coroner of Ramsey County to fill the unexpired term of **Dr. Carl Ingerson**, who resigned August 1. Dr. Henderson has been deputy coroner for ten years. Dr. Ingerson, after holding the office of coroner for thirty-six years, resigned because of ill health.

* * *

A new clinic building is being constructed in Glencoe by **Dr. Arthur Neumaier**. The building, which is expected to be completed by November 1, will also have offices for a dentist.

* * *

Dr. Carl R. Wall, Minneapolis, was the subject of a biographical sketch in the Town Toppers column of the *Minneapolis Star* on August 2.

* * *

Dr. William R. Bagley, Duluth, has been reappointed a member of the St. Louis County Sanatorium Commission for three years.

* * *

Dr. and Mrs. C. A. Boline, Battle Lake, left in mid-July for a two-month tour of Europe. While they are away, Dr. Boline's practice is being conducted by **Dr. George DeBelly**, formerly of Nebraska.

* * *

Dr. Joseph P. Connolly of the Malerich Clinic, W. St. Paul, is taking a one-year residency in internal medicine at Miller Hospital, St. Paul.

* * *

Three retired members of the Mayo Clinic staff, Rochester, have been awarded certificates of merit by the University of Minnesota in honor of their long service as members of the faculty of the graduate school. Receiving the certificates were **Dr. Henry P. Wagener**, who retired July 1, and **Dr. Fred Z. Havens** and **Dr. Luther Thompson**, both of whom retired April 1.

* * *

A new federal office has been set up in Bemidji to administer Indian medical and public health activities in Minnesota, Wisconsin, Michigan and Iowa. Acting medical officer in charge of the office is **Dr. Sidney Finkelstein**, Cass Lake.

* * *

Dr. M. D. Starekow, Thief River Falls, was elected president of the Thief River Falls board of education at its organization meeting in mid-July.

* * *

Selected as the first member of the Sandstone Hall of Fame, **Dr. H. P. Dredge** was honored at a

OF GENERAL INTEREST

banquet in the Sandstone State Hospital on July 16. Dr. Dredge, now eighty-four, has practiced medicine at Sandstone for fifty-two years. Always active in civic and community affairs, Dr. Dredge was also one of the promoters of the new Pine County Memorial Hospital being erected at Sandstone. The waiting room of the hospital will be furnished in his honor.

* * *

Dr. Louis A. Buie, Rochester, has been appointed a national consultant to the Surgeon General of the U. S. Air Force. The medical department of the Air Force does not have a formally organized group of civilian consultants but calls on qualified men when necessary.

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Dr. John Eustermann of the Mankato Clinic, Mankato, has been appointed to the board of directors of the Minnesota Heart Association.

* * *

Dr. Paul M. Smith, Lake Crystal, was elected president of the Southern Minnesota Chapter of the Minnesota Academy of General Practitioners at Mankato in June. Other officers elected were Dr. Daniel Halvorsen, Owatonna, vice president, and Dr. Orville Jones, Mankato, secretary-treasurer. Principal speaker at the meeting was Dr. Asher White, Minneapolis, who spoke on "Diseases of the Chest Resembling Heart Diseases."

* * *

Construction of a new Alexandria Clinic has begun at Alexandria. The building, which will measure 60 by 106 feet, is expected to be completed by January 1. The clinic staff is composed of Dr. G. W. Clifford, Dr. H. L. Stensrud, Dr. C. E. Carlson, Dr. L. F. Wasson, Dr. P. M. Geiser, Dr. D. E. Perkins, and Dr. W. G. Heegaard. The clinic has been in its present location for ten years.

* * *

Dr. William V. Knoll, formerly of Duluth, has become pathologist at the new St. Joseph's Hospital, Brainerd. Dr. Knoll, who formerly was pathologist at St. Mary's Hospital, Duluth, was honored before he left for his new post at a testimonial dinner in Duluth in June. He has been succeeded at St. Mary's by Dr. Arthur C. Aufderheide, formerly associate pathologist at the hospital.

* * *

Miss Jeanne Mary Reince and **Dr. Robert Louis Koller**, Minneapolis, were married at St. Matthew's Catholic Church, Green Bay, Wisconsin, on June 25.

* * *

Dr. Allan J. Blake and **Dr. James A. Blake**, Hopkins, were honored at a dinner in late June by the police and fire departments of Hopkins. They were presented with engraved plaques in appreciation of their years of "good-natured service in time of emergencies."

* * *

Dr. C. L. Sherman, Luverne, has been elected president of the Southwestern Minnesota Sanatorium district for the forty-first consecutive time.

Dr. W. W. Higgs, Park Rapids, was recently honored at ceremonies at the University of Wisconsin marking his fifty years as a physician. Dr. Higgs has practiced in the Park Rapids area for forty-three years.

* * *

Dr. John S. Lundy, Rochester, has been appointed a member of the medical advisory committee of the American National Red Cross. The committee is limited to nine members.

NEW LOCATIONS

Dr. John B. Rutledge, recently discharged from the Air Force, has opened offices for the practice of medicine in Frazee.

Dr. John K. Meinert has become associated with the Lakeland Medical Center, Willmar.

Dr. Edward Kiolbasa has become associated in practice with **Dr. F. M. McCarten** and **Dr. R. E. Carlson** in Stillwater.

Dr. F. D. Bucher, recently in service in the Navy, has reopened his offices in the Starbuck Clinic, Starbuck.

Dr. William P. Miller, a former Ortonville resident, has become associated in practice with **Dr. John Allen** in Montevideo.

Dr. Robert Fedor, a native of Worthington, has become affiliated with the Litchfield Clinic, Litchfield.

Dr. W. B. Halme, after two years in military service, has resumed his practice in Wadena.

Dr. Howard R. Snider, formerly of Minneapolis, has become associated with the Mankato Clinic, Mankato.

Dr. Marvin W. Johnson, formerly of Milaca, has become associated in practice with **Dr. Joseph C. Houts** in Dassel.

Dr. Raymond Chittum has become affiliated with the East Range Clinic in Aurora.

Dr. Virgil A. Watson, formerly of Kalamazoo, Michigan, has become associated in practice with **Dr. William C. Dodds** in Detroit Lakes.

Dr. Karl Helwig has opened offices for the practice of medicine in Grove City.

Dr. Arnold L. Hamel has become associated in practice with **Dr. M. H. Seifert** and **Dr. J. A. Dupont** in Excelsior.

Dr. Jack H. Gardner has opened offices for the practice of medicine in Ceylon.

Dr. Abraham Alpert has become affiliated with the East Range Clinic at Virginia.

Dr. Fredric L. Mast, formerly of Minneapolis, has become associated with the Adams Clinic in Chisholm.

Dr. A. J. Lenarz, after several months of post-graduate surgical training in St. Paul, has resumed his practice at Browerville. Now associated with him in practice is **Dr. William J. Byrne**, formerly of St. Paul.

Dr. John B. O'Leary, formerly of Minneapolis, has become associated in practice with **Dr. B. J. Hughes** in Brainerd.

OF GENERAL INTEREST

Dr. Vernon Vix, formerly of Minot, N. D., has become affiliated with the Worthington Clinic, Worthington.

Dr. Carol L. Plott of Lancaster, Penn., will become associated in practice with **Dr. R. W. Nicholson** at Heron Lake on September 1.

Dr. Alvin C. Peterson, son of the late Dr. A. A. Peterson, has returned to Mora to open offices for the practice of medicine.

Dr. Joseph E. Henry, after a year of military service in Germany, has resumed the practice of medicine at Milaca.

Dr. Donald G. Alton has become associated in practice with **Dr. H. P. Hinderaker** in Bird Island.

Dr. W. G. Larson has become associated in practice with **Dr. R. F. Mears** in Northfield.

Dr. Arthur Sethre has become affiliated with the Fergus Falls Clinic at Fergus Falls.

Dr. Richard Runquist has become associated in practice with **Dr. J. V. Carlson** in Westbrook.

Dr. Paul H. Potter, after a term of service in the Army, has begun a four-year residency in pathology at St. Luke's Hospital, Duluth.

Dr. Troy Rollins, formerly of Elmore, has finished a two-year period in the Navy and has joined the staff of the Rochester State Hospital. On January 1, 1956, he will start a three-year residency in dermatology at the Mayo Clinic.

Dr. Myles Eftelund, formerly of Erskine, has joined the staff of the Karlstad Hospital, Karlstad.

Dr. Dennis E. Lofstrom and **Dr. Robert E. Wilson** have taken over the operation of the Pine River Clinic, Pine River.

MINNESOTA BLUE SHIELD-BLUE CROSS

Statistics just released from Minnesota Hospital Service Association reveal that during the first five months of 1955 a total of 69,198 hospital cases resulted in payment of benefits in excess of \$8,000,000.

During the same period in 1954, a total of 70,422 hospital cases resulted in benefit payments of approximately \$7,400,000. Though cases in the first five months of 1955 showed a slight decrease, the number of days of hospital care increased from 422,219.1 in 1954 to 429,982.8 in 1955.

The four most predominant diagnoses are still respiratory, digestive, pregnancy and accidents. Pregnancies during the first five months of 1955 ranked first, with a total of 11,477 cases paid by Blue Cross.

Since 1933, 1,799,192 Blue Cross subscribers have used approximately 11,000,000 days of hospital care and \$119,000,000 in benefits.

As of May 31, 1955 approximately 1,006,423 Minnesotans were covered by Blue Cross.

At the Annual Meeting of the Minnesota State Medical Association in Minneapolis in May of 1955, increased interest in Blue Shield was clearly shown by the more than 200 doctors who visited the Blue Shield booth.

Among the subjects that were most important to the doctors was the physician-patient relationship. Many were of the opinion that prompt and correct filing of Blue Shield claims and rapid processing of the claims by

Blue Shield lead to an improved relationship between the doctor, his patient, and Blue Shield.

Doctors' comments and questions were varied, but pertained primarily to the methods involved in the reporting of services rendered and the payment of claims. From the information exchanged, it is believed that many of these problems may be solved by a more complete report of the services rendered. Every effort has been made by Blue Shield to provide a Medical Service Report or claim blank which is worded in such a manner as to reduce to a minimum the time and effort required for its proper completion. Items contained in the Blue Shield Medical Service Report which are frequently incomplete and result in delayed payments are: the date the doctor's service was rendered, the description of the service rendered, the hospital admission and discharge date, the signature and serial number of the attending physician, Workmen's Compensation status, and the relationship of the patient to the subscriber. Omission of these items requires Blue Shield to obtain additional information from the doctor's office and results in the delayed payment of the claims involved. The delay incurred by incomplete data may result in a disturbed patient relationship and may lead to dissatisfaction between the patient, the physician, and Blue Shield.

FRACTURES OF THE PELVIS

(Continued from Page 564)

results of the treatment of the fractured pelvis, but rather upon the damage to the upper end of the femur with the possibility of aseptic necrosis.

Separation of the symphysis is accompanied by separation of the sacroiliac joints posteriorly. The degree of pain and disability varies directly with the extent of the separation. These patients were managed initially by suspending the pelvis in a sling and compressing the wings of the ilium together. Stabilization of the symphysis does not depend upon bony healing. Soft tissue healing should be sufficiently strong in about three weeks, after which activity was encouraged. These patients had considerable persistent pain over the sacroiliac joints posteriorly, which was treated by the use of a trochanteric belt.

Conclusion

In this group of fractures of the pelvis, associated additional injuries occurred in two-thirds of the injured patients. These coincidental injuries were frequently of much greater importance than the pelvic fracture. Three-fourths of the fractures of the pelvis could be treated simply, without recourse to special methods of management.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

INTESTINAL OBSTRUCTIONS. Third Edition. Owen H. Wangensteen, B.A., M.D., Ph.D. Professor of Surgery, University of Minnesota, Minneapolis. 838 pages. Illus. Price \$15.50, cloth. Springfield, Illinois: Charles C Thomas, 1955.

HANDBOOK OF PEDIATRICS. Henry K. Silver, M.D., Associate Professor of Pediatrics, Yale University School of Medicine; C. Henry Kempe, M.D., Assistant Professor of Pediatrics, University of California School of Medicine, San Francisco; and Henry B. Bruyn, M.D., Assistant Professor of Pediatrics and Medicine, University of California School of Medicine and Assistant Clinical Professor of Pediatrics, Stanford University Medical School, San Francisco. 548 pages. Illus. Price \$3.00, paper cover. Los Altos, California: Lange Medical Publications, 1955.

THE MAYO CLINIC. Lucy Wilder. 2nd edition. Illus. \$3.75. Springfield: Charles C Thomas, 1955.

This thin volume is a judicious condensation of a great deal of material that could have been written about the Mayo Clinic. One can only imagine the fortitude required to keep it brief and the anguish over material necessarily omitted. The book is a genuine triumph of selection. For the most part, it has been prepared in response to a demand on the part of the visitors to Rochester for authentic information about the origins of the Mayo Clinic, its present organization and an explanation of the many buildings that are part of the medical work there. This purpose has been beautifully fulfilled by Mrs. Wilder's book.

The charitable work of the founders of the clinic is suitably portrayed as traditionally a part of the physician's life then and now and in all latitudes and climes.

It is not likely that much of the content of this book will be new information to the readers of this journal. As a simple and really charming explanation of the Mayo Clinic, the book can be sincerely recommended.

WILLIAM B. MARTIN, M.D.

CAN WE FURTHER REDUCE INFANT MORTALITY?

(Continued from Page 562)

interest of the fetus. Early detection and treatment of toxemia factors should be emphasized. The avoidance of podalic version and difficult mid-forceps with studied management of mid-pelvic contractions is advised. Early diagnosis of multiple gestation with restriction of activities from the seventh month on is to be recommended. Perhaps the common practice of performing a repeat cesarean section two weeks before the expected date of confinement should be altered to one week or less. There are frequently miscalculations as to the length of gestation.

The most critical period in the lives of the mother and her baby is during labor and delivery. Special care and judgment must be used in prolonged labor. More

attention should be given to the immediate postpartum care of the newborn infant, especially during the first eight minutes after birth, when conditions occur which often lead to death in the early hours or days of fetal life. This period is definitely the obstetricians' responsibility. He should know how to resuscitate the baby and administer the necessary care. Most of the deaths occur in the first twenty-four hours of life or so-called "critical period."

Further reduction in neonatal mortality requires improvement of pre-natal care, starting early in pregnancy; the prevention of preventable deaths in hospitals; and the reduction of mortality, particularly in early age and in low weight groups. A continuous and more extensive neonatal mortality study as well as an intensive study of fetal deaths will help reach this desirable objective.

BILATERAL GLENOID HYPOPLASIA

(Continued from Page 569)

cases also showed webbing of the axillae and marked limitation of abduction.

Although several cases of bilateral glenoid hypoplasia have been described in the European literature, we are unable to find a description of this entity in a patient from this country. Because of the non-incapacitating nature of the deformity it seems likely that the majority of the patients do not seek medical advice.

Conclusions

1. A single case of bilateral glenoid hypoplasia is described.
2. Bilateral failure of development of the secondary ossification centers for the inferior rims of the glenoids is associated with flattening of the humeral heads, limitation of abduction, and external rotation and webbing of the axillae.
3. The malformation is apparently not associated with familial or hereditary factors. There seems to be no sex predominance.
4. Reviews of several cases in European literature have been presented. No case reported from this country has been encountered.

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5. Andreasen, A. T.: Congenital absence of the humeral head. J. Bone & Joint Surg., 30-B:333, 1948.